

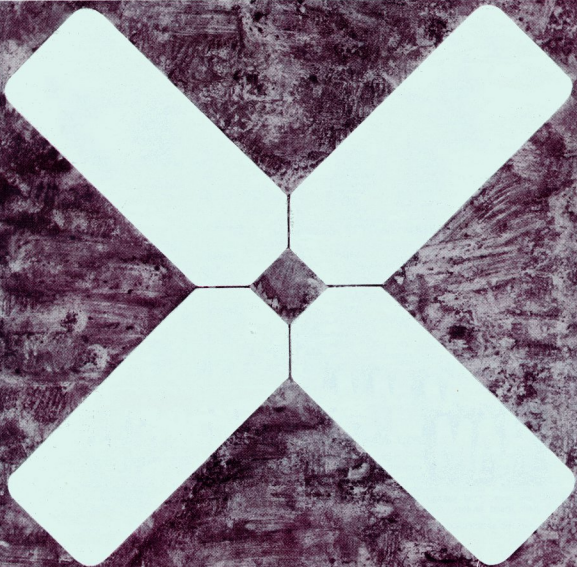
amateur radio

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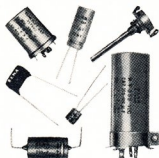
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SIDEBAND ELECTRONICS ENGINEERING ANTENNA SUPPLIES

Last month's (Sept. 1969) issue of "Amateur Radio" carried a picture on the front cover of the latest Tri-band Amateur Beam development. It was not the best of a picture, done in a hurry on very short notice. Anyway, after an aborted attempt some ten years ago in the U.S.A. by GONSET, this is the second and very successful case of a full size 3-element 10-15-20 Metre Tri-band Yagi Beam. All other types of tri-band beams feature element lengths shorter than the standard half wavelengths on 15 and 20 Metres, but not the new TRIPLE-THREE. For instance, the reflector length is the full 35 ft., boom length 18 ft., weight approximately 50 lbs., 2" boom diameter and mast clamp for 2" diam. mast, with built-in 52 ohm Balun. Elements are 1 1/4" at the centre, tapering to 1/2" at the ends.

The manufacturer of the TRIPLE-THREE is J-Beam Engineering Ltd., of Northampton, England, a well known firm in the U.K., making VHF, TV and HF Antennas for the U.K. Government, Army and Navy. The price of the TRIPLE-THREE is £60 (approx. \$131) in the U.K. I expect to have them in stock in November 1969 at a target price, S.T. and all other charges included, of \$180. I shall then be carrying stocks of five different types of tri-band beams and four types of multiband verticals. If the choice becomes difficult, here are my recommendations:

Choice No. 1—HY-GAIN TH6DX, 6-element master beam, 24 ft. boom length.

Choice No. 2—TRIPLE-THREE J-Beam.

Choice No. 3—MOSLEY MP-33 Tiger-array.

Choice No. 4—HY-GAIN TH3JR or MOSLEY TA33JR.

The TH6DX, TRIPLE-THREE and MP-33 will safely handle more than our legal power limits, the TA33JR and TH3JR are junior beams and not recommended for the maximum power limit; also, they can be rotated with the CDR AR-22R heavy duty TV rotator, the choices 1 to 3 require a HAM-M heavy duty rotator.

Trapped multi-band vertical antennas like the HY-GAIN 14AVO and 18AVO, and the NEWTRONICS 4-BTV are handy for restricted space locations but must have an effective counterpoise to perform properly. Unless one has a metal roof or similar structure or a good conductive soil structure, this counterpoise must be made up with a minimum of two quarter wavelength long radial wires per operating band. Otherwise these verticals will not be very satisfactory. They are also excellent for portable work, easily assembled and broken down in maximum 5 ft. long parts and mounted on an iron stake into the ground, on a bracket on a caravan, etc.

Attempts to obtain another supply of multiband dipoles, W3DZZ types or otherwise, are being made again.

—Arie Bles.

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14-230 AC/DC SWAN Power Supply	\$150
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GALAXY—

GT-550 Transceiver	\$625
External VFO	\$100
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TH6DX 6-Element Tri-band Beam	\$180
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CDR HAM-M Heavy Duty Rotator	\$165
AR-22R Junior Rotator	\$60

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ACITRON 101 12-Volt Heavy Duty DC Supply	\$105
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INTRUDER WATCH AND THE W.I.A.

The Wireless Institute of Australia, like the R.S.G.B. and A.R.R.L., has initiated an Intruder Watch programme. The programme was initiated by a decision of the Federal Council in 1967 who saw the need for such a programme as an important aspect of the Institute's task of protecting Amateur frequency allocations.

A recent issue of "QST" pointed to the reason why Amateurs need an Intruder Watch. It quoted the Radio Regulations Geneva, 1959, the currently effective international document as follows:

"Article 3, Section 3: Administrations of the Members and Associate Members of the Union shall not assign to a station, any frequency in derogation of either the Table of Frequency Allocations given in this Chapter or the other provisions of these Regulations, except on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of this Convention and of these Regulations."

The significance of this provision is that it does not prohibit the allocation of a frequency contrary to the Frequency Table—but makes the allocation contravene the Regulations only when interference is caused. Of course, a broadcasting station in, say, the 40 metre Amateur band, will cause interference to the Amateur Service, but the onus is on the Amateur to demonstrate the interference.

Of course all interference is not the result of deliberate acts. The Intruder Watch also serves to draw attention to inadvertent interference, spurious transmissions caused by faulty equipment or by faulty tune-up procedures, which together with harmonics can also result in interference to Amateurs. Complaints about such transmissions usually result in their rectification. The important function of Intruder Watch is to report the interference. Until the interference is reported, the intruder on Amateur bands may be legitimately there. Basic-

ally, any Intruder Watch must depend on the listener or observer.

The significance of reports spread over a vast area such as our continent, is obvious. To be successful, Intruder Watch cannot depend on only a few observers. The initiative for the organisation of the observers rests with the Divisions. Each Division appoints an Intruder Watch Co-ordinator. How he undertakes his task depends largely on his Division and himself. The reports are collated by the Federal Intruder Watch Co-ordinator who passes the information on to the appropriate authority, the Postmaster General's Department. The Federal Co-ordinator also co-ordinates the general activities of the Divisional Co-ordinators, sending out information in regular bulletins and providing them with standard stationery and specifying standard procedures. At least this is how it should work.

Reports have come to the Federal Co-ordinator from two Divisions only since the formal appointment of Divisional Co-ordinators. This, of course, may be due to a number of reasons. It should be noted that the appointment of the last Divisional Co-ordinator occurred only a little over a year ago. Probably, though, the most important reason for this paucity of reports lies in the fact that there are insufficient Amateurs willing to undertake the task of acting as observers. Perhaps some of the fault may lie with the W.I.A. Have we really published enough information so that every member knows how important this activity is to the Amateur Service? Make no mistake about it—Federal Executive is a little disappointed in the response to date. We want a Federal Intruder Watch Co-ordinator to be complaining of overwork—not underwork.

If you want to know how you can help in your Division, contact your Divisional Intruder Watch Co-ordinator. His name was published on page 14 of the June issue of "Amateur Radio". It may be that some may question whether the Institute's programme is perhaps a little over-elaborate. We

don't think so. There are two points about the Institute's programme that are important and these, we think, justify a formal structure rather than a system that depends on Amateurs being urged "to write letters to the Post Office" when intruders are observed. The Institute can only pass the reports on to the appropriate authority.

If the complaint is in respect of an overseas country, certainly no individual could make direct representation to that country. Such complaints may involve official diplomatic representations direct to the country concerned or through the headquarters of the International Telecommunications Union in Geneva. These representations can only be initiated through the Postmaster General's Department. The Postmaster General's Department is also directly responsible for acting on complaints originating within the Commonwealth of Australia. The Department requires complaints to be submitted to it in a proper form.

The Federal Executive has discussed the problems involved with interference reports with officials of the Department and a procedure has been developed so that reports can be easily and effectively processed by the Department.

The other point about Intruder Watch is this. Reports of interference must be reliable. One of the most important tasks of the Divisional Co-ordinators is to guarantee the standard of reports submitted. Misleading or inaccurate reports are not merely worthless, they are positively harmful to the cause of the Amateur Service.

One of the difficulties facing the Institute in carrying out its prime responsibility of protecting Amateur frequency allocations is that it involves activities in which our membership generally can only participate remotely. Intruder Watch represents one area where not only can all members participate, but without their participation the job just cannot be done.

MICHAEL J. OWEN, VK3KI,
Federal President, W.I.A.

Australis-Oscar 5 Satellite ready for Launch

DON GRAHAM,* VK3BAC, and RICHARD TONKIN†

It now seems likely that the AUSTRALIS OSCAR 5 Amateur Radio Satellite will be launched into orbit shortly after 15th October.

Official confirmation of the planned launch date is expected as this issue of "Amateur Radio" goes to press. The latest information on the launch date may be obtained from the Project Oscar State Co-ordinators, whose names and addresses are listed below, or by listening to the W.I.A. Divisional broadcasts on Sunday mornings.

While AUSTRALIS OSCAR 5 may ride piggy-back into space with one of several different satellite series, the Radio Amateur Satellite Corporation (AMSAT) (which is co-ordinating the launch in the U.S.) suggests that the TOS (TIROS Operational Weather Satellite) orbit is a practical one to consider as an example for the Radio Amateur Satellite. Many Radio Amateurs are already tracking TOS satellites to obtain local cloud cover pictures (APT). A typical TOS orbit has the following parameters:

Height: 910 statute miles.
Inclination to equator: 101.5 degrees (polar orbit).
Period: 114 minutes.
Launch Site: Western Test Range, California.
Launch Direction: East to West.
Launch Time: Around 9 p.m., A.E.S.T.

Times of nearest overhead passes:
Around 3 p.m. local time (ascending node, south to north),
around 3 a.m. local time (descending node, north to south).

A detailed description of the AUSTRALIS OSCAR 5 Satellite has already been published in "Amateur Radio". Readers are particularly referred to the following articles:

Australis Oscar A—Users' Guide, "Amateur Radio," Feb. 1968, p. 3.

Australis Oscar A—Users' Guide, Part Two, "Amateur Radio," March, 1968, p. 10.

Using a Phase Comparator, "Amateur Radio," April, 1968, p. 12.

It should be noted that the telemetry calibration curves published in "Amateur Radio" in March 1968 have since been redrawn, owing to re-calibration of the satellite by AMSAT. The correct calibration curves appear elsewhere in this article. Also, the Project Oscar State Co-ordinators' list has been updated and is now as follows:

* Victorian Co-ordinator, Project Oscar, 38 Murray Drive, Burwood, Vic., 3125.

† Chairman, Project Australis, 5/39 Tooronga Road, East Malvern, Vic., 3145.

New South Wales:

V.h.f. and T.v. Group,
14 Atchison Street,
Crows Nest, 2065.

Victoria:

Don Graham, VK3BAC,
38 Murray Drive,
Burwood, 3125.

Queensland:

Laurie Blagborough, VK4ZGL,
54 Bishop Street,
St. Lucia, 4067.

South Australia:

Brian Tideman, VK5TN,
33 Ningana Avenue,
Kings Park, 5034.

Western Australia:

Kevin Bicknell, VK6ZBC,
48 Sanderson Road,
Lesmurdie, 6076.

Tasmania:

Peter Frith, VK7FF,
181 Punchbowl Road,
Launceston, 7250.

These Co-ordinators can be contacted regarding any aspect of the launch, orbit, operation, tracking, etc., of the satellite. They will be kept fully advised of all developments concerning the satellite.

What is AUSTRALIS OSCAR 5 and what will it do?

The satellite carries two amplitude modulated transmitters; one of 50 mW. on 144.050 Mc. which will operate continuously, and one of 150 mW. on 29.450 Mc. The 29.450 Mc. transmitter will be switched on and off by nominated ground stations in order to conserve the life of the satellite's chemical batteries. It is planned that this transmitter will be operated over each weekend so that it can be monitored by the maximum number of Radio Amateurs. If all goes well with the launching, the h.f. transmitter will be commanded on at around 0700 GMT each Friday and off at around 0700 GMT each Monday.

How long will the Satellite Transmit?

It is expected that the satellite's batteries will enable it to operate for approximately two to three months.

What Information will be Transmitted?

Both transmitters will carry the same telemetry data, by means of a group of seven sequential bursts of audio tone (channels), followed by an identifier of HI in Morse code by audio frequency shift keying. The HI contains no telemetry data. The frequency of each of the seven telemetry tones is a measure of one of the following:

- Channel 1: Battery current drain.
- " 2: X axis horizon sensor.
- " 3: Battery voltage.
- " 4: Y axis horizon sensor.
- " 5: Internal (electronics package) temperature.
- " 6: Z axis horizon sensor.
- " 7: Skin (inside casing) temperature.

Each "channel" is of approximately 6.5 seconds duration. Frequency variations noted on Channels 2, 4 and 6 compared over several weeks will indicate how well the simple magnetic stabilisation experiment is controlling the satellite's orientation in space. The success of the technique used could assist in improved performance of future Amateur transponder satellites by reducing fading caused by spacecraft spin.

How can the Telemetry be Measured?

Useful information on the spin rate may be possible by direct observation of the appropriate Channels 2, 4 and 6. For example, after launch there may be three "bleeps" or changes in frequency on Channel 2, two on Channel 4 and no frequency change on Channel 6. After a week or two in orbit, the data on these three channels will probably have changed, indicating that the magnetic stabilisation system is slowing the satellite's spin rate. For example, there may be one change of frequency on Channels 2 and 4 and two such changes on Channel 6. These figures are purely hypothetical, since it cannot be accurately determined, until the satellite is in orbit, just what its orientation in space will be.

The frequency of the telemetry tones for Channels 1, 3, 5 and 7 may be measured by:

1. Audio oscillator and phase comparator.
2. CRO, audio oscillator and Lissajous figures.
3. Direct reading audio oscillator.

As there will be times when the received signal/noise ratio will be poor (e.g., when the satellite is near the local horizon), method 1, followed by method

2 is recommended. Method 3 should only be attempted when the signal/noise ratio is extremely good.

What Reception Reports are Required?

All reception reports are welcomed. Special telemetry reporting forms are available from the State Co-ordinators. In the case of the 29.450 Mc. transmitter, a report that the signal is **not** audible when it should be, i.e. when the satellite is in radio range and the transmitter is switched on, is very useful. Likewise, any h.f. signals heard when the satellite is below the horizon should be noted on the telemetry reporting form. Completed forms should be returned to the appropriate State Co-ordinator.

How well will the Signals from the Satellite be Received?

As the "piggy back" launches likely to be available to AMSAT are of a higher altitude than originally planned by OSCAR, received signals will be weaker by about 6 db. However, the satellite should be clearly readable by reasonably well-equipped stations. For example, typical cases at a range of 2,500 nautical miles are:

1. Frequency 144.050 Mc.
Antenna gain +13 db.
Receiver noise figure 3 db.
Receiver bandwidth 5 Kc.
Then signal/noise at rx ... 11 db.
2. Frequency 29.450 Mc.
Antenna gain 0 db.
Receiver noise figure 3 db.
Receiver bandwidth 5 Kc.
Then signal/noise at rx ... 17 db.

As it will not be uncommon for signal levels to fall below 1 μ V. in 50 ohms at the receiver input, a low noise converter or pre-amplifier will be a good investment.

When will the Satellite be Audible?

It is possible that the 29.450 Mc. transmitter will be audible at times when the satellite is below the radio horizon. This will depend on the state of the ionosphere between the ground receiver and the satellite. Over-horizon reports of the 29 Mc. signal will therefore be of particular interest.

Orbital predictions to assist in reception of the satellite are available from State Co-ordinators.

How are the Orbital Predictions Produced?

For a satellite in a given orbit, that orbit is defined by the time and position that the satellite crosses the equator, travelling northwards. This is called the "Ascending Node".

On the basis of various ascending node positions, a set of "Standard Orbits" have been prepared for all States. These "Standard Orbits" give the azimuth and elevation of the satellite at two-minute time intervals, from the station. A typical example is shown below:

Standard Orbits for Melbourne for ascending node 45° West

Minutes after Ascend. Node	Azimuth	Elevation
84	171	3
86	165	9
88	159	15
90	144	19
92	131	15
94	123	10
96	119	5

Table 1.

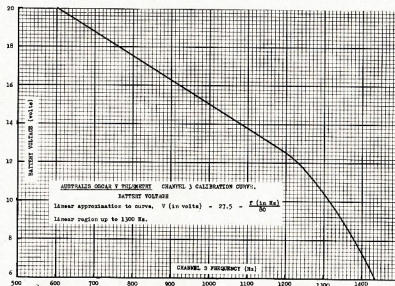
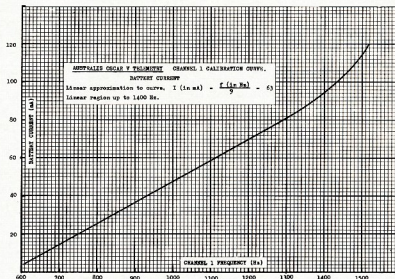
"Standard Orbits" are now available from State Co-ordinators, as are the projected "Ascending Nodes" predictions for the first few days after launch. An example of the "Ascending Node" data is shown below:

Ascending Nodes for Australis Oscar 5

Date	Orbit	Time (GMT)	Ascend. Node
31 Oct. '69	0693	0326	356
31 Oct. '69	0694	0507	020
31 Oct. '69	0695	0648	044
31 Oct. '69	0696	0829	070
31 Oct. '69	0697	1010	096

Table 2.

If, for example, a station wished to track orbit number 0695 on 31st October, 1969, the appropriate "Standard Orbit" (Table 1), i.e. the "Standard Orbit" having an ascending node closest to the selected orbit, would be chosen. The antenna pointing figures are thus calculated:



Orbit Number 0695, 31st Oct., 1969

Time (GMT)

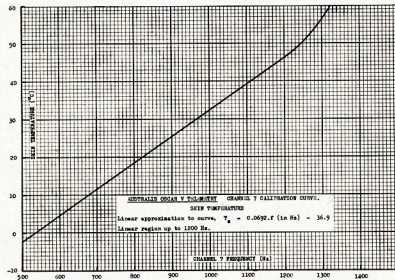
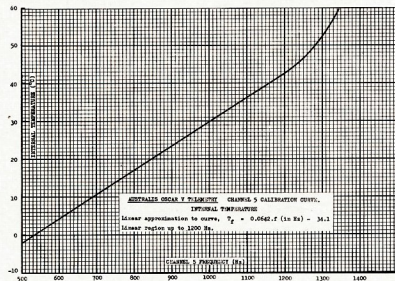
Time of Ascend. Node (plus added Minutes)	Azi- muth	Eleva- tion
0648 + 84 = 0812 GMT	171	3
+ 86 = 0814 GMT	165	9
+ 88 = 0816 GMT	159	15
+ 90 = 0818 GMT	144	19
+ 92 = 0820 GMT	131	15
+ 94 = 0822 GMT	123	10
+ 96 = 0824 GMT	119	5

Table 3.

Thus, for example, the satellite would be located at an azimuth of 159° and elevation of 15° at 0816 GMT on 31st October, 1969. Ascending nodes will be

supplied, on a regular basis, to State Co-ordinators beginning immediately after the launching into orbit of the satellite.

AUSTRALIS OSCAR 5 will be the first Amateur Radio Satellite launched since Oscar 4 went into orbit almost four years ago. Help make the flight of this first Australian-built Amateur Satellite a success! Prepare for the launch, listen for the satellite's signals and send in your reception reports. Every valid reception report will be acknowledged by a handsome QSL card to signify that the recipient helped to make the flight of AUSTRALIS OSCAR 5 a success.



1969 W.A.D.M. CONTEST

To celebrate the foundation of the German Democratic Republic in October 1949, the Radio Club of the G.D.R. sponsors an annual DX Contest. An invitation is extended to all Amateurs to participate in the 1969 W.A.D.M. Contest.

Object: To contact as many DM stations as possible.

When: 1500 GMT, 3rd October, until 1500 GMT, 4th October.

Sections: (a) Single operator; (b) Multi-operator; (c) Short Wave Listeners.

Bands/Mode: All bands 80-10 metres, c.w. only.

Call: "CQ DM".

Exchange: RST plus a three-figure serial number starting from 001.

Points: Complete QSOs, 3 points. Incomplete QSOs, 1 point. Listeners will receive 1 point for each new DM station heard together with the transmitted number.

Multiplier: Obtained by adding the multipliers from each band.

Each band multiplier is equal to the number of DM districts plus the number of DM7, 8 and 9 stations worked on that band. The districts are indicated by the last letter of the DM call signs (A through O). A maximum multiplier of 15 is allowed for each band.

Use a separate log for each band and send within four weeks to: Radio Club of the G.D.R., DM Contest Manager, DM2ATL, DDR 1055, Berlin, P.O. Box 30, German Democratic Republic.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

VK3MS	317/340	VK5AB	298/314
VK3AHO	312/326	VK4FJ	285/304
VK6RU	312/327	VK4TY	285/288
VK4HR	309/327	VK4KS	284/289
VK3JZ	307/324	VK2APK	277/282
VK9MK	304/323	VK3TL	271/277

New Members:

Cert. No.	Call	Total
99	VK2SG	234/236
100	VK3WV	161/161
101	VK3JM	103/103
102	VK4SD	115/115

Amendments:

VK3ZE	233/234	VK3SM	176/179
VK4DO	224/236	VK3AMK	176/176
VK3LW	208/214	VK4RF	145/145
VK4VC	181/181	VK4XJ	134/136

C.W.

VK2QL	301/323	VK2APK	270/278
VK3AIQ	301/315	VK3XZ	270/284
VK4FJ	290/314	VK3YL	270/287
VK3CX	289/312	VK3ARX	269/278
VK4HR	283/305	VK6RU	266/269
VK2AGH	282/296	VK3NC	264/277

New Members:

Cert. No.	Call	Total
95	VK2SG	136/142

Amendments:

VK4TY	259/272	VK4DO	188/205
VK3KS	229/236	VK4UC	171/172
VK4SD	192/206	VK4RF	128/140

OPEN

VK4HR	313/337	VK6MK	305/324
VK6RU	313/338	VK2EO	302/325
VK2AGH	312/332	VK4FJ	286/322
VK3VW	307/334	VK2APK	284/304
VK4SD	307/321	VK3ARX	282/301
VK4TY	307/321	VK3TL	287/293

New Members:

Cert. No.	Call	Total
119	VK3HE	105/106
120	VK3QV	106/106
121	VK4SD	307/321

Amendments:

VK3XB	279/291	VK4RF	190/202
VK2SG	268/274	VK4XJ	180/187
VK4DO	244/260	VK3OG	107/107
VK4UC	240/241		

ANTENNA FARMING ON 7 Mc.

Rhombics—Signal-to-Noise Ratio

A. J. C. THOMPSON,* VK4AT

BEING old fashioned, but still true to my Amateur status, I naturally am an experimenter. As such, I am entitled to lacerate the big ears of the very learned with my startling interpretation of the contents of sundry text books. In their turn these same gentlemen will themselves do likewise to others higher up in the academic scale. The only apparent solution to that state of affairs is for writers of any standard to write within the limits of their own knowledge and also within the limits of the comprehension of those that they wish to inform.

This particular article is based on the practical experiments that have been conducted here over the past three years. During that time at least four different types of antennas, all on 7 Mc., were actually in use. Chaos reigned supreme for quite awhile. This may sound like a real rat-bag set-up, yet, owing to much early training in experimental work (not in this field), I do work fairly systematically toward a definite goal.

In the present instance experimenting was very necessary if I was to get normal signals into and out of this valley. My QTH is completely surrounded by hills. It is famous for bad radio and t.v. reception. Starting off with a very temperamental off-centred multiband made things worse. Fortunately in experimental work I have passed the stage where I could look at facts and see just what I wanted to see. At this stage of my life I don't, now, even lead my willing self "right up the garden path". Facts to me now are just facts.

Contrary to popular belief, there is still a large unexplored region to explore in the study of antennas. Theorists themselves admit this. They follow only one path in each field. Regardless of how intricate the necessary calculations are, or how delicate the instruments be, there must ultimately come the stage of power to complete the process. This brings things within the capability of us and our own instruments. In my own case I started off with a Command tx on 60 watts on a.m. Due to ignorance and the above disabilities, I was soon able to be recognised as the star performer in all VK4 land when it came to putting out an erratic signal.

After three years of antenna experimenting and still with the same gear on a.m., I am now as consistently strong in the southern States as the others who have better gear and modes. Under bad QRM conditions on 7 Mc. at night I even have all that band to myself as far as the VK4s are concerned. This is due to the excellent signal-to-noise ratio of this big rhombic when used

on the receiver. From this experience I am convinced that the most important thing on 7 Mc. is to have good signal-to-noise ratio gear. The rhombic in this regard is far superior to all others tried. At the other end is the multiband. It collects all the QRM that is around.

Modern text books now pay increasing attention to this signal-to-noise ratio, in keeping with modern trends in receiver construction. On the transmitter the rhombic never lived up to its reputation. I have erected three of them, all of $\frac{1}{2}$ wavelengths per leg on 7 Mc. in size. The first one had a high ridge running right down the long axis, thus separating each half. The second and third had three legs across steep gullies and the other over comparatively low ground. I now attribute transmitting failures (tested against a dipole and later a 4-element yagi) to the following:

- (1) My inability to balance up the two vees forming the rhombic.
- (2) The high angle of radiation.
- (3) The landscape difficulties causing the above.
- (4) The lack of reporting stations E. and W.
- (5) The probable fact that it always radiated E. and W.
- (6) That although erected as a rhombic, it was acting as two vees in reverse, connected in series.

In order to test the axis behaviour of the rhombic a 4-element yagi was erected beaming right down the rhombic's long axis South to Sydney. Strength 4 against 8 for the yagi there, was 8 and 8 respectively at Adelaide on occasions, but usually 4 there also. It may have been better further out.

Feed-line variations were tried. These included (1) antenna tuners of various brews, (2) half-wave feed lines, (3) tapered lines, (4) stubs, (5) quarter-wave transformers of both 1 and 2 stages, (6) 300 ohm t.v., also home-brew open line of diam. x 6—300 ohms, and diam. x 100—600 ohms, and wider spacers up to 14 inches.

Indicators were used including lamps, fluorescent tubes and field strength meters outside and similar meters, tubes and bulbs inside. A constant recurring feature was the particularly good signal-to-noise ratio when the rhombic was connected to the receiver. I was conscious of this but had kept no track of it. Now, under bad QRM conditions, the contrast between the yagi and rhombic was startling and quite unexpected because both faced S. It didn't take long to adopt the view that they actually were operating at right angles. If this proved to be the case, then a lot of puzzling questions were answered.

In support of the view that the rhombic actually was radiating along its short axis was the fact that from a

signal-to-noise ratio angle the rhombic was nearly always superior, but when it failed then the yagi came good. A good signal-to-noise effect suggests either an attenuation which is greatest on the unwanted signal or the reverse which could be a beam effect favouring the wanted signal. All this may appear as a back-to-front approach to experimenting—to get results first then look for the cause afterwards—but it is quite in keeping with standard practice, to look for unusual behaviour or a visible misfit.

We now look at the rhombic from this new angle and from the transmitting point of view. Another description of a rhombic is two vees in reverse connected in series. This can be done practically by Zepp feeding either side. Antiresonant feeding the East vee gave no results but feeding the W. side gave similar but better results than normal feed to the rhombic. In this case with the vees not symmetrical, the rhombic radiated along its short axis even without feeding in antiresonance.

A rhombic at this QTH with its long axis N. and S. but radiating E. and W. along its short axis will drop a received signal by about two S points usually. When that is recovered by the receiver the favourable signal-to-noise ratio on the rhombic would range from just clipping the QRM peaks to as much as quite normal strength at a comfortable listening standard, compared with impossible reading by the yagi and dipole. It is presumed that the QRM would be coming from the South then.

In actual action the antennas are at right angles but tests with other antennas at right angles have not given the same actual results. It should be noted though, that when the rhombic fails, the yagi comes good and is a little better than either the rhombic or the dipole. It is presumed that the QRM is then coming from the West as the western side vee is fed in antiresonance.

Another factor noted on all three rhombics was that the signal strength on the receiver gave no indication of the probable performance of the transmitter. The only explanation that I have comes from a text book, "that, with a rhombic, the receiver is more tolerant to a mismatch than a transmitter". Thus the law of Reciprocity is not transgressed. But I quote the law—from Jasik, "Antenna Engineering"—he is referring to its application in reference to arrays "Though the reciprocal relationship between transmitter and receiver antennas are easily accepted. It is especially easy to see that the receiver power from an advancing plane wavefront is greater when intercepted by a large broadside array than when intercepted by a small

(continued on page 19)

* Skyrings Creek, Pomona, Qld., 4568.



The completed Multi-Tester. This little device will fit neatly in the palm of one's hand, but its use rivals that of several separate and perhaps much larger instruments. The labels for the jacks and switch positions were made with a tape embossing machine.

A COMPACT MULTI-PURPOSE TEST INSTRUMENT*

YARDLEY BEERS, WOJF, ex-WOEXS

A COMPACT test instrument which was built for use with various suitcase portable stations is shown in the photographs and in Fig. 1. The instrument is useful for stations ranging from transistor outfits with powers of less than a watt to those of the SB-33 transceiver class.¹ Contained in a box $3\frac{1}{2}'' \times 3'' \times 2\frac{1}{4}''$ is a device which can perform the functions of all the following equipment:

- Reflectometer-type standing wave detector,
- Multi-range voltmeter,
- Radio-frequency probe,
- Two-range ohmmeter,
- Resistance-substitution box, and
- Frequency calibrator using quartz crystals for reference.

This instrument was designed around a miniature microammeter, $1\frac{1}{2}''$ in outer diameter, with a full-scale reading of 200 microamperes and an internal resistance of 600 ohms. The author bought this meter on the surplus market some years ago. It is unlikely that many readers can obtain an exact duplicate, but several inexpensive miniature meters appear to be good substitutes. With some of these, it may be necessary to use a slightly larger box, and it may be necessary to alter some of the resistance values given in the circuit diagram, in accordance with the procedure which is described later.

Originally, the intent was to build only a standing-wave detector, which is often needed to help match the impedances of the various hawky antennas inevitably used in portable operation. However, it seemed a shame to tie up a sensitive meter for this purpose only. Why not provide an extra switch position which allows the meter to be connected to a pair of pin jacks? This function would be especially useful because some of the small transmitters have no built-in meters, but only include test points for use with an external meter. Then, why not add another pin jack with a crystal diode

so that it can be used to detect r.f. or a.c.? By a continuation of this reasoning, the present circuit gradually evolved.

In the early stages of the development of this circuit, the place for S2 and the resistors R3 through R9 was occupied by a 50,000 ohm control. Its sole purpose was to set the needle exactly on full scale on the forward (F) position of the reflectometer or on the high resistance scale of the ohmmeter. However, it was realized that this control could also serve as a multiplier for a voltmeter, which would have a full scale reading of 10 volts. In addition, it was considered desirable to be able to measure the B+ voltage of the SB-33, about 500 volts. If the control value were made a high-enough resistance to serve as a multiplier for this range, its adjustment would be much too critical in other applications. Therefore it was decided to give up the luxury of being able to set the needle exactly on full scale, and the control was replaced by the present stepped resistance scheme which results in a much more versatile instrument. The precision is limited by error of reading the miniature meter, which has only twenty divisions. Therefore, the use of high-precision resistors for the multiplier is not fully justified, and common five and ten-per cent. resistors were used in this network except in a couple of cases for which the junk box just happened to yield a precision resistor of the right value.

CONSTRUCTION

The photographs show the construction layout used by the author. One of the $3\frac{1}{2}'' \times 2\frac{1}{4}''$ sides of the box serves as the front panel. On this panel are mounted the meter, two rotary switches, and four pin jacks. Of the two switches, S1 selects the function, and S2 controls the sensitivity. On the back are mounted the input and output r.f. connectors, the fifth pin jack (R), and, on the inside, a holder for a 1.5-volt penlight cell.

The heart of the standing-wave detector is a piece of RG-58/U co-axial

line about two feet long. The outer plastic covering has been removed, and a piece of enamelled magnet wire has been slipped under the shielding braid. The ends and mid-point are brought out through the shielding. This cable is coiled up and attached to the inside of one of the $3\frac{1}{2}'' \times 3''$ surfaces by means of some wire, solder lugs, and machine screws. In the centre of this coil is mounted a bracket for holding the two FT-243 quartz crystals used in the frequency calibrator. Also mounted on this surface is a terminal strip which is used mainly to support the other components of the standing wave detector. The value for R2 is selected with the penlight cell in place, with S1 set at V, and with S2 set at zero. With a jumper connected between the OHMS and the + test jacks, select a value which will give a full-scale meter deflection.

OPERATION

For the sake of protecting the meter, the switches S1 and S2 are left in their off positions when the instrument is not in use. For use, S2 is set to the least sensitive position (R9, or 500 volts full scale), and S1 is set to select the desired function. The sensitivity is then increased by turning S2 towards R3 until the needle reads maximum without going off scale. The selection of the function is not determined solely by S1, but partially by the selection of pin jacks, as described in detail below.

REFLECTOMETER

For the reflectometer, none of the pin jacks are used. The r.f. signal enters and departs on co-axial connectors. This portion of the circuit is standard in design and has been modelled on descriptions contained in "The Radio Amateur's Handbook". S1 is first turned to the forward (F) position and the needle is brought to a high scale reading by turning S2, as given in the paragraph above. Call the value of this reading A. Then S1 is turned to the back (B) position, where the needle reads value C. The voltage reflection coefficient then equals $C \div A$, and the voltage standing wave ratio is $\frac{A+C}{A-C}$.

MEASUREMENT OF D.C. VOLTAGES

For the measurement of d.c. voltages, S1 is turned to V, and the unknown voltage is applied between the pin jacks + and -. The voltage calibration at all scale is obtained by multiplying the full-scale current reading by the sum of the resistances in the circuit (the value selected by S2 plus the internal meter resistance). These full-scale voltage values are given after the respective resistors in the table included with Fig. 1.

MEASUREMENT OF A.C. AND R.F. VOLTAGES

For observation of a.c. and r.f. voltages, the unknown voltage is applied between the pin jacks AC and —, allowing the diode CR3 to be connected in series with the voltmeter circuit. Then the procedure is the same as for d.c. voltages. (The meter should be

* Reprinted from "QST," April 1969.
1 The SB-33 transceiver is rated at 70 watts p.e.p. output on the lower frequency bands.
—Editor.

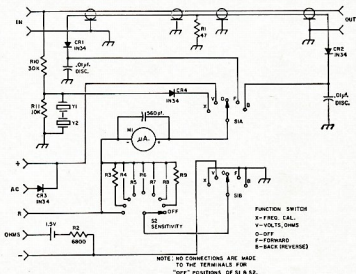


Fig. 1.—Schematic of the Multi-Purpose Test Instrument. Resistances are 1/2 watt, values in ohms, K equals 1,000. See text for resistance tolerances and modification of values shown. In the author's instrument, Y1 and Y2 are quartz crystals cut for 3995 and 7125 Kc. respectively, although the builder may substitute crystals for any calibration frequencies desired, as explained in the text.

CR1 through CR4—See text.

R1—See text.

R2, R10, R11—See text.

R3—390 (0.2 volt).

R4—3,300 (0.8 volt).

R5—10,000 (2 volts).

R6—39,000 (8 volts).

R7—0.1 meg. (20 volts).

R8—1 meg. (200 volts).

R9—2.5 meg. (500 volts).

S1—Rotary, 1 section, 2 poles, 5 positions (1 position unused), non-shorting.

S2—Rotary, 1 section, 1 pole, 11 positions (2 positions unused), non-shorting.

calibrated previously against known a.c. voltages. The higher voltage ranges cannot be used for a.c. or r.f. measurements because the diode will be damaged if the peak inverse voltage exceeds a safe value. With 1N34 diodes, the voltage should be kept under 20 volts r.m.s.

R.F. PROBE

The instrument may be used as an r.f. probe by connecting a pick-up loop between the AC and — pin jacks. Alternatively, an antenna may be connected to these jacks. A resistor or an r.f. choke must also be connected between the two jacks, if the antenna does not provide a d.c. return.

OHMMETER

For use of either ohmmeter range, S2 is set to zero and S1 is set to V. For the higher resistance range, the unknown resistance, X, is connected between the OHMS and + pin jacks. R2 has been previously selected to give a full-scale deflection D when a jumper is connected between these two jacks. With X in place, the deflection is E. It may be shown that, if R_m is the meter resistance,

$$X = \frac{(D - E)(R_2 + R_m)}{E}$$

This expression may be used to provide a calibration. Alternatively, the scale may be calibrated by connecting a number of known resistors, noting the deflections, and plotting a graph.

For the lower resistance range, the unknown value is connected in parallel with the meter. A jumper is connected between the OHMS and + jacks, and the unknown resistance is connected

between the + and the R jacks. The lowest unknown resistance values will give the smallest meter deflections. The calibration can be determined by circuit theory if the meter resistance is known. However, if it is not known,

the calibration can be determined by plugging in known resistors and noting the readings. (The internal meter resistance R_m is the same as the value of an "unknown" resistor connected in this manner which gives a one-half scale meter reading, if R2 is very much larger than R_m .)

RESISTANCE SUBSTITUTION BOX

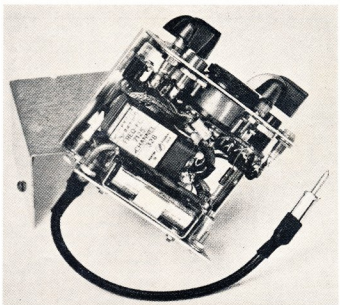
S2 and its associated resistors R3 to R9 may be used as a resistance substitution box. Set S1 on V, and connect to the R and — jacks.

FREQUENCY CALIBRATOR

The crystal frequency calibrator uses two quartz crystals connected in series, the resistors R10 and R11, and the diode CR4. S1 is switched to the X position, and the meter reads the rectified voltage developed across the quartz crystals. R11 parallels the crystals to provide a d.c. return. R10 drops the r.f. voltage from the antenna line down to a couple of volts and also prevents a significant amount of the total transmitter power from being lost in this circuit. CR4 rectifies the r.f. which is read as d.c. on the meter.

As the frequency of the transmitter is varied, the meter reading changes very little except near the resonant frequencies of the crystals. If you tune in the direction of increasing frequency through crystal resonance, the meter suddenly deflects downward, then deflects upward, and then finally returns to a steady value. Either the minimum, the cross-over, or the maximum readings can be used for frequency reference.

If the highest accuracy is desired, a calibration in terms of another frequency (continued on page 14)



This photograph shows the parts layout used by the author. S1 is shown on the left, the meter at the center, and S2 on the right of the front panel. The sockets for the crystals are shown mounted near the center of the instrument, and the penlight cell with its holder are visible on the rear panel. Beneath the quartz crystals may be seen the shield of the co-axial line used in the reflectometer section of the device.

A SOLID STATE AMATEUR S.S.B. RECEIVER

PART ONE

B. G. CLIFT and A. E. TOBIN*

The first of a series of articles by Fairchild engineers describing the circuitry and construction of a Solid State Amateur S.S.B. Receiver

WITH the rapid development being currently made in the semiconductor industry, technology has advanced to a stage where the uses of integrated circuits may be a practical and economical realisation for the Amateur. The aim of this project is to design a high performance receiver using semiconductors from the consumer product range. Where integrated circuits are comparable economically they are used in preference to discrete components. Many engineering "fanciful ideas" have been disregarded because of the economics involved, and so this receiver is not intended to be "state-of-the-art" performance-wise, but will be comparable with present day commercial standards.

looked. Careful attention will be given to the mixer designs to produce the most desirable non-linear law to minimise the problem of harmonics which can produce difference frequencies falling within the crystal filter pass band.

The system lends itself readily for generating a single sideband signal on the same frequency as the received signal. The common elements for transceiver operation are:

1. The b.f.o. frequency as carrier oscillator.
2. The 9 Mc. filter and i.f. for sideband suppression.
3. The oscillator injection frequency for heterodyning the sideband signal to the received signal frequency.

quency synthesiser using the indirect method of a phase locked loop. This would provide automatic receiver calibration, crystal stability for both receiver and transmitter, and the capability for a digital frequency display in place of the normal dial. It would appear that the economics would now take on new dimensions, but the feasibility of the basic synthesiser is being examined.

CONSTRUCTION

One of the biggest problems in constructing an Amateur receiver is that of mechanical layout and assembly. Coil switching for the various bands usually involves a tailored wafer switch with the coils mounted as close as practical to the appropriate wafer. To avoid this problem a standard 12-position turret tuner has been used to good advantage. On account of the physical dimensions of some of the coils, it has been necessary to restrict the coverage to six bands. These were selected as follows:

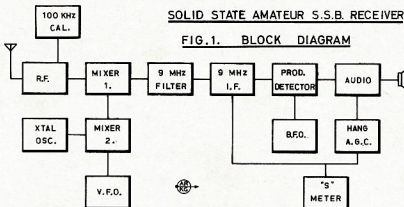
- 80 metres (3.5-4 Mc.).
- 40 metres (7-7.5 Mc.).
- 20 metres (14-14.5 Mc.).
- 15 metres (21-21.5 Mc.).
- 10 metres (28-28.5 Mc. and 29-29.5 Mc.).

The r.f. amplifier and first mixer are assembled in the turret tuner which has been suitably modified with an extension shaft and additional switch wafers connected to the rear. An Eddystone die-cast box is used to house the v.f.o., thus providing the mechanical rigidity essential for stable operation.

The receiver is built in an instrument cabinet measuring approximately 19" wide by 6½" high by 13" deep. No attempt has been made to miniaturise the construction, but rather to use modular techniques using plug-in printed circuit boards which are assembled in a rack within the cabinet. The printed circuit boards are arranged to plug in from the rear of the cabinet,

SOLID STATE AMATEUR S.S.B. RECEIVER

FIG.1. BLOCK DIAGRAM



BLOCK SCHEMATIC

As shown by the block schematic (Fig. 1) the system used is one of single conversion with a fixed v.f.o. providing a tuning range of 500 Kc. A 9 Mc. i.f. was chosen because of the readily available Pye 9-0A 4-pole crystal filter. The filter provides about 40 db. skirt selectivity, and is considered just adequate.

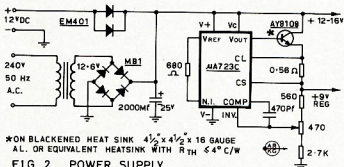
A v.f.o. frequency range from 5-5.5 Mc. was chosen since it lends itself readily for direct single conversion of two Amateur bands, 80 metres and 20 metres. The other bands are provided by heterodyning the v.f.o. with suitable crystal oscillators in the second mixer to achieve the desired oscillator injection frequency.

The r.f. amplifier will consist of two cascoded transistors providing better sensitivity than a FET and comparable cross-modulation performance. The problem of spurious signals generated by the two mixers has not been over-

The only additional circuit blocks required to complete the transceiver are:

1. Audio pre-amplifier.
2. Balance modulator.
3. Linear mixer.
4. R.f. amplifier.

It is hoped that the v.f.o. of 5-5.5 Mc. will be replaced with an optional fre-



*ON BLACKENED HEAT SINK 4½" x 4½" x 16 GAUGE
A.L. OR EQUIVALENT HEATSINK WITH $R_{TH} \leq 4^\circ C/W$

FIG 2 POWER SUPPLY

* Applications Laboratory, Fairchild Australia Pty. Ltd., 420 Mt. Dandenong Road, Croydon, Vic., 3136.

Page 14

ROSS HULL MEMORIAL VHF/UHF CONTEST, 1969-70

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian and Overseas Amateurs and Short Wave Listeners to participate in this annual Contest which is held to perpetuate the memory of Ross Hull whose interest in v.h.f./u.h.f. did much to advance the art.

A Perpetual Trophy is awarded annually for competition between members of the W.I.A. in Australia and its Territories, inscribed with the name and life work of the man whom it honours. The name of the winning member of the W.I.A. each year is also inscribed on the Trophy. In addition, this member will receive a suitably inscribed certificate.

OBJECTS

Australian Amateurs will endeavour to contest as many other Amateurs in Australia and Overseas under the following conditions.

DATE OF CONTEST

From 0001 hours E.A.S.T., 6th December, 1969, to 2359 hours E.A.S.T., 11th January, 1970.

DURATION

Any seven calendar days within the dates mentioned above, not necessarily consecutive. These periods are to be at the operator's convenience. A calendar day is from 0001 hours E.A.T. to 2359 hours E.A.T.

RULES

1. There are two divisions, one of 48 hours duration, and one for seven days. In the seven-day division, there are three sections:—

- (a) Transmitting, Open.
- (b) Transmitting, Phone.
- (c) Receiving, Open.

2. All Australian and Overseas Amateurs may enter for the Contest whether their stations are fixed, portable or mobile.

3. All Amateur v.h.f./u.h.f. bands may be used, but no cross-band operating is permitted. Operators are cautioned against operating transmitting equipment on more than one frequency at a time, particularly when passing cyphers. Cross-band operation to assist contest working is prohibited.

Such operation will be grounds for disqualification. Cross mode contacts will be permitted.

4. Amateurs may enter for any of the transmitting sections. The seven-day winner is not eligible for the 48-hour award.

5. Only one contact per band per station is allowed each calendar day.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

7. Entrants must operate within the terms of their licences.

8. Cyphers: Before points may be claimed for a contact, serial numbers must be exchanged. The serial numbers of five or six figures will be made up of the RS (telephony) or RST (c.w.) report plus three figures, commencing in the range 001 to 999, for the first contact, and will then increase in value by one for each successive contact. When a contestant reaches 999 he will then commence again with 001.

9. Entries must be set out as shown in the example, using only one side of the paper. Entries must be post-marked not later than 9th February, 1970, and clearly marked "Ross Hull Contest" and addressed to Federal Contest Manager, Box N1002, G.P.O., Perth, W.A., 6001.

10. Scoring for all sections will be based on the attached table. Approx. distances to be shown in the log entry as shown in the example. Failure to make this entry will invalidate the particular claim. Some typical distances are given in the attached table.

11. Logs: All logs shall be set out as in the example and in addition will carry a summary sheet showing the following information:

Name.....Call Sign.....
Address.....Division.....
.....Claimed Score.....

SCORING TABLE

Distance in Miles	52 Mc.	144 Mc.	432 Mc.	578 Mc.	Higher
Up to 25 Miles	1	1	2	5	20
26 to 50 "	1	1	10	20	50
51 to 100 "	2	5	25	60	100
101 to 200 "	5	10	50	125	200
201 to 300 "	15	15	75	175	250
301 to 500 "	10	20	100	250	300
501 to 1050 "	5	25	200	300	350
1051 to 1500 "	10	50	250	350	400
1501 to 2500 "	20	100	300	450	500
2501 to 3500 "	35	200	400	500	600
3501 to 5000 "	50	300	450	550	650
5001 and over	100	400	500	600	700

Operating Dates.....(7 cal. days)
Highest Score over a 48-hour period was.....points.

Operating period:

from.....hrs. E.A.T. /...../8.....
to.....hrs. E.A.T. /...../8.....

Declaration: I hereby certify that I have operated in accordance with the conditions of my licence and abided by the Rules of the Contest,

Signed.....
Date.....

12. Entrants not abiding by the Rules of this Contest will be disqualified.

13. The ruling of the Federal Contest Committee of the W.I.A. will be final. No dispute will be entered into.

14. Awards: Certificates will be awarded to the winners of each section in each VK and Overseas Call Area. The VK contestant who returns the highest score in the transmitting section and who is a financial member of the W.I.A., will have his name inscribed on the Trophy which will be awarded by his Division for the prescribed period. A Certificate will be awarded to the contestant who shall not be the Trophy winner, and who returns the highest scoring log covering a period of any 48 consecutive hours.

Also, Certificates will be awarded for operating in the Ross Hull Contest and breaking any Australian v.h.f./u.h.f. distance record.

RECEIVING SECTION

1. Short Wave Listeners in Australia and Overseas may enter for the Contest, but no transmitting station may enter.

2. Contest times and logging of stations on each band are as for the transmitting sections, however there is no 48 hour sub-section.

3. To count for points, logs will take the same form as for transmitting sections, but will omit the serial number received. Logs must show the call sign of the station heard (not the station worked), the serial number sent by it, and the call sign of the station being worked.

Scoring will be on the same basis as for transmitting stations, i.e. on the distance between the Listener's station and the station heard. See the examples given. It is not sufficient to log a station calling CQ.

4. A station heard may be logged only once per calendar day on each band for scoring purposes.

5. Awards: Certificates will be awarded to the highest scorer in VK and Overseas countries.

EXAMPLE OF TRANSMITTING LOG (Brisbane Station)

Date/Time E.A.S.T.	Band	Emission	Power	Call Sign	RST/No. Sent	RST/No. Rcvd.	Dist. Miles	Points Claimed
24th Dec. 0100 E.A.S.T.	52	A3(a)	VK7ZAI	59001	59004	1110	10	
0110 E.A.S.T.	52	A3(a)	VK4NG	89002	57061	330	10	
0230 E.A.S.T.	144	A3	VK5ZK	56003	55043	990	25	
0235 E.A.S.T.	144	A3	VK3ZJO	45004	49021	850	25	

EXAMPLE OF RECEIVING LOG (Perth S.W.I.)

Date/Time E.A.S.T.	Band	Call Heard	RST/No. Sent	Station Called	Dist. Miles	Points Claimed
2nd Jan. 1025 E.A.S.T.	52	VK5ZDX	59221	VK8KK	1330	10
1025 E.A.S.T.	52	VK2ZCF	58195	VK8ZAA	2040	20
1110 E.A.S.T.	432	VK6ZDS/G	57061	VK8LJ/K	60	25
3rd Jan. 0235 E.A.S.T.	144	VK5ZJH	44102	VK6ZCN	1330	50

Radios of a Passing Era

RODNEY CHAMPNESS,* VK3UG

During my stay at Macquarie Island in 1967 I became well acquainted with Dr. Ken McTaggart, VK3NW, with whom I had many interesting QSOs. In this period, and later on, many things were discussed and I discovered one of Ken's activities—amongst other equally interesting hobbies—is the collection and re-conditioning of old radio sets (or wireless sets as they were then known) of the pre-1930 era.

Ken commenced his collection of old radios in 1966 and now has 30 sets all in order, although the number could well be higher by the time this reaches print. As well as many old sets, his collection of old radio valves dating from World War I, to about 1930 is impressive, as can be seen from portion shown in photo No. 3. One 1922 valve in particular (photo No. 4) is the first of the IC's as it contains three triodes and the RC coupling between them all in one envelope. It just plugs into a variety of receivers, the simplest of which has only two coils and a tuning condenser plus the inevitable horn speaker. The circuit of one receiver using this valve is shown, the IC components being indicated by heavy lines.

The two oldest receivers are a 1923 Western Electric Superhet—yes, they did have superhets. then—and a 1922 Polar Blok 2-valve regeneration set. The latest is a t.r.f. 4-valve a.c. set of 1930 vintage. Right throughout this era superheterodyne sets were being built, although I, like many others, had the mistaken idea that they were rare in the early days. The credit for the development of the type must go to Major Armstrong during W.W. I. He is also responsible for many other radio inventions of note, including the super-regenerative receiver.

The performance of Ken's "Old Faithfuls" is quite remarkable to people of this generation and the quality of reproduction better than many transistor radios—not that the latter sound wonderful on their 2" speakers. The sensitivity is surprising considering the low gain of the valves and many of the 2 or 3-valve regenerative sets really pull in the DX!

I must admit the old horn speakers do leave much to be desired in quality, but the balanced armature cone speakers are quite good despite widely held ideas to the contrary.

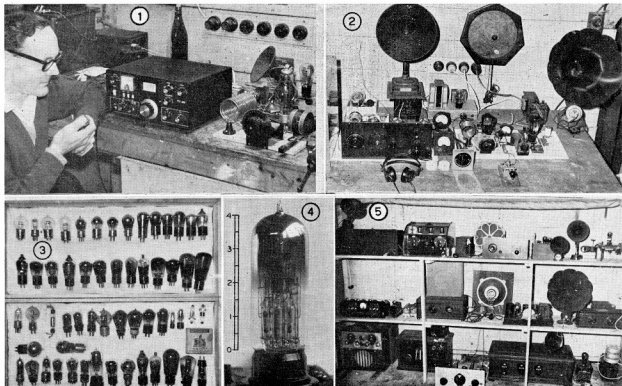
Not only has Ken restored these old receivers, but he has built a couple of

transmitters using old parts, old construction methods and the transmitter circuits of this early age in radio's history. A station consisting of a 3-valve receiver and a 2-valve c.w. transmitter is seen in photo No. 2. The receiver line-up is a 201A regen. detector, followed by a 201A audio headphone amplifier to a 201A speaker output valve. The detector runs 45 to 50 volts and the other valves about 100 volts h.t. It tunes from 5,000 metres (60 Kc.) to 40 metres (7 Mc.) using honeycomb coils. This set resolves side-band and the recovered audio is just as good as the average s.s.b. receiver of today. Many might be incredulous, but this is fact.

The transmitter runs two E406 valves, one as the crystal oscillator or v.f.o. and the other as a p.a. Input power is 10 watts c.w. on 80 and 160 metres. Using v.f.o. control, Ken has worked a number of 2L and VK stations with no worse report than TB.

Photo No. 1 is a comparison between Ken using a late model transistorised s.s.b. transceiver and a single-valve transmitter using a W.W. I. Army Type C Mark III. valve (an AT50) in a Hartley circuit. This particular transmitter normally runs 40 watts on 80

* 24 O'Dowds Rd., Warragul, Vic., 3820.



metres although it could run up to 160 watts. Statistics of the AT50 are 8 volts at 2.85 amp. on the heater and 1,000 volts at 100 mA. max. plate dissipation. The Army used it at 50 watts. The valve was manufactured by Marconi, Osram and G.E.C. No illumination is necessary in the shack when this valve is operating due to its tungsten filament which really radiates light.

During the 160 metre contest last year this rig was fitted with a genuine 1927 type 210, running 9 watts input and earned Ken 5th place. Every single

report was T9—largely due to the oscillator being run continuously during transmission and the co-ax. feeder to the antenna only being keyed. Since the input to the 210 scarcely altered from key-up to key-down, there was no chirp or click.

Ken operates on several bands from 160 to 10 using c.w. and s.s.b. A three element beam is used on 20, 15 and 10 metres.

In conclusion, I must admit that Ken has a most interesting display of early radio equipment (part of this is shown in photo No. 5) which many of us

younger Amateurs would never have the chance to know or see. This collection in my opinion makes a very valuable contribution to the history of radio in Australia and I sincerely wish him luck in obtaining missing items. Perhaps some readers can help in this. Ken VK3NW will always welcome visitors to inspect the old gear, but would appreciate a phone call first (64-4041 ext. 225 at work, and 82-1141 at home) to ensure that he will be there as he often migrates to the peace of the country at week-ends.

— . . . —

FEDERAL CONSTITUTION CHANGE OF W.I.A.

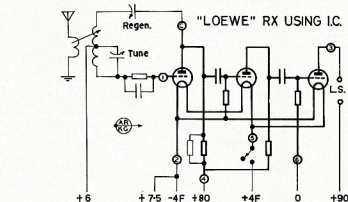
Notice of Motion following has been given to Federal Executive by the Victorian Division of the W.I.A.:

"That Clause 62 of the Federal Constitution be amended by deleting the word 'March' and inserting in lieu thereof the word 'January', and that further, in the interpretative clauses of the Federal Constitution the definition of the term 'Fiscal Year' be deleted and in lieu thereof be inserted 'Fiscal year means the year commencing the first day of January in each year'."

The effect of this is to change the financial year's commencing and finishing dates to allow more time for the preparation of audited statements to be submitted to the Federal Convention.

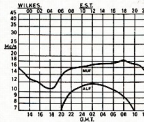
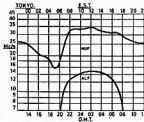
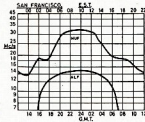
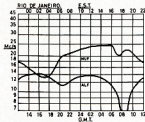
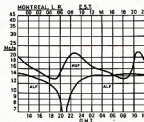
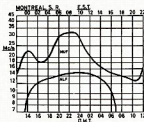
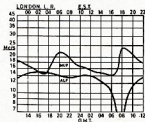
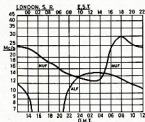
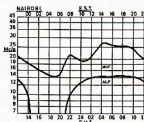
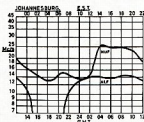
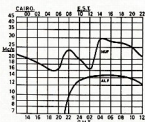
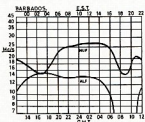
Article 70 of the Federal Constitution requires the publishing of this notice in two consecutive issues of the Institute's official journal.

—Peter D. Williams, VK3JZ,
Federal Secretary, W.I.A.



PREDICTION CHARTS FOR OCTOBER 1969

(Prediction Charts by courtesy of Ionospheric Prediction Service)



Opening Address for 1969 Remembrance Day Contest

The following is a copy of the Opening Address for the 1969 Remembrance Day Contest by Hon. Phillip Lynch, Minister for the Army and Local Member for Flinders in the House of Representatives:

"Mr. Federal President, Amateurs and Shortwave Listeners.

"At radio sets throughout Australia today the instruments, lights and dials of your radio represent far more than the technicalities of a complex medium for flashing a message of communication across an air space to a colleague seated before an electronic instrument.

"Today is a day of reflection for all Radio Amateurs throughout the length and breadth of this country as you in your nation-wide organisation reflect on the supreme sacrifice paid in two World Wars by the members of the fraternity of wireless.

"It is a day when the wonder of science, when technological expertise and accomplishment, the miracle of communication, should in a very real sense, give way to something that comes from the soul and heart—the memory of a comrade who can no longer be with you.

"Many of you listening know better than any words I may utter just what this Remembrance Day means. Remembrance and honour of one's fallen comrades is not a tangible thing which can be pointed to, or held up for inspection for people to say 'see, here it is'.

"No, it is something much more than that and in the organisation which is bringing this message to you all, it is memory of someone who was special, not only because he was a friend, but he was also a member of a brotherhood, a group of people who have a unique association through the common interest of radio.

"With the manifold achievements of this electronic age the role of the Amateur might be overlooked. But, let it not be forgotten that the Amateur operator contributed to the development of those techniques and inventions which have enabled man to take the giant scientific strides he has. And, today, Amateurs can enjoy the results of these new discoveries through their own enthusiasm for a past time which is as satisfying and productive as it is enjoyable and rewarding.

"Men from this band of Amateur enthusiasts became the first additions to Australia's fighting manpower strength following the declaration of war in 1939. In those days there was an organisation known as the Royal Australian Air Force Amateur Radio Reserve and from these ranks came the first of a long line of Amateurs to give outstanding service to their country and for some to pay the supreme price.

"And, it should be realised that it was during World War II that man worked and developed radio at an almost unbelievable pace, a standard which has not slowed over the passage of years. Many of the men behind those activities were Amateurs, the only group in the community who had the technical knowledge and skills necessary for specialised work of this type.

"It would be inappropriate if, on such a day, I did not mention that the Wireless Institute of Australia is the oldest radio society in the world. Your organisation is formulating exciting plans for the Institute's 60th anniversary celebrations next year, and with the planning which has already been undertaken I have no doubt that these celebrations will be eminently successful.

"But, let me now comment on the contribution which radio is making today in the field of communications which form so vital a part of the society in which we live.

"Although the events of the past month will no doubt give impetus to making the latter part of the 20th century as the space era, it is only because of the part played by radio and electronics that man's latest achievements have been possible.

"The 20th century must be considered as the epoch of radio and electronics, for it is during this period of time that man has so developed this science that it acts as his dutiful servant in an incredible number of keynote fields.

"As Minister for the Army I am always conscious of the tremendous contribution made by radio. Up to the 1950's radio in the Army was always considered to be a secondary means of communication because of the inherent disadvantages associated with noise, propagation, weights of equipment and like factors, and was used only where line was not available.

"Army requirements always seemed to need communication over distances just beyond ground range into that area known as the 'skip distance', and appeared to be an insuperable problem area as all of you well know.

"However, this is now a matter of history. The size of equipment has been reduced by the advent of transistors, printed circuits and micro-miniaturisation, resulting in greater power-weight ratio. The use of frequency modulation reduced the noise factor and single side-

band has almost doubled the efficacy of our high frequency equipment.

"As a result, we find that today's tactical military traffic, whether operational or administrative, is passed by radio, almost to the complete exclusion of other means.

"I should stress, however, that the Army's needs for increased communications go hand in hand with the need for increased efficiency and it has been necessary to rely on the automatic processing of traffic over multi-channel circuits to cope with the million and a quarter words a day which pass over the Army's signal system.

"The world-wide use of satellites is becoming more and more economical in the commercial, military and entertainment spheres. Already Amateurs have moved on to their own satellites with the launching of the Orbital Satellite Carrying Amateur Band (Oscar) series and are currently working in the space field using the moon as a passive reflector.

"When I look back over the history of Radio Amateurs, I am reminded of the many of their ranks who have contributed so much knowledge and experience towards the current state of the art of communications today. This is due to the Amateurs' incessant capacity to imagine and initiate, thereby placing him constantly in the front rank of technical progress.

"I am also mindful of the many who gave service in the Armed Forces and of the tremendous benefit which their experience afforded to these Forces.

"Today is your memorial day, the day on which you commemorate those of your ranks who gave their lives for their country.

"There could be no better way of perpetuating their interests in such a fascinating, scientific, rewarding and interest consuming pastime than to hold this memorial competition which I am privileged to officially now declare open."

WIRELESS INSTITUTE OF AUSTRALIA FEDERAL EXECUTIVE

The Institute can now offer annual subscriptions to following Amateur Journals:

- ★ "QST"—Associate membership and renewals, \$6.40.
- ★ R.S.G.B. "Radio Communication" (ex "The Bulletin") is only sent with membership of Society. \$5.50. Send for application form.
- ★ "CQ" Magazine, \$5.70; Three Years, \$13.50.
- ★ "73" Magazine, \$5.50; Three Years, \$11.50.
- ★ "Ham" Magazine, \$5.50; Three Years, \$11.50.

R.S.G.B., A.R.R.L., "CQ" and "73" Publications available.

Send remittance to Federal Executive, C/o. P.O. Box 36,
East Melbourne, Vic., 3002.

Receipt of your first issue will serve as acknowledgment of your sub. Allow six weeks for delivery.

Victorian Division 160 Metre Field Day

ANTENNA FARMING

(continued from page 10)

Sunday, 3rd August, 1969, saw the greatest yet representation of 160 metre portable and mobile stations in the field in VK3.

The area of operation was the Mornington Peninsula and the shores of Port Phillip and Westernport Bays. Activity started officially at 1100 hours E.A.S.T. after the VK3 Divisional Broadcast, when the call-back was taken by Dick VK3RZ using the call sign VK3AWI/P. Dick continued as control station during the day and took hourly call-backs as well as assisting field stations in contacts. A watch was kept also on 7135 Kc. for reports from stations unable to transmit on 160 metres.

Good signals over the whole of the Peninsula area were heard from Al VK3AP at Elwood Beach. Considerable enterprise was shown by Graeme VK3BAT and his colleagues, Bob VK3BBR, Robin VK3AYZ and Tony at Arthurs Seat. An antenna erected from the top of the high lookout tower ensured good signals from their modified 62 set.

On the other side of the bay, at Point Henry, Cedric VK3ACH was deterred from using his full 30-foot high vertical antenna because of gale force winds. However, it seemed to make little difference to his signals which were very strong in all areas.

Early in the afternoon, John VK3AUJ made several transmissions from an unnamed location, and invited portable and fixed stations to report their estimates of his position to the control station. The "estimates" varied from one end of the Peninsula to the other, but Don VK3ADP named the spot exactly to win the award. John was in the parking area on Oliver's Hill just out of Frankston.

Further highlights of the day were contacts with Ray VK3ATN at Birchip by Theo VK3AMA, Cedric VK3ACH and John VK3AUJ. The distances involved, between 160 and 200 miles, demonstrated the effectiveness of these

portable stations. Harold VK7MZ, at Devonport, worked Theo and was heard by two other portable stations. Theo thus won the longest distance award.

All participants were delighted with the day, and a further outing will be held in the Yarra Valley on 9th November. More details on the VK3 broadcasts. The large number of stations operating portable leaves no doubt of the popularity of the 160 metre band in VK3. Counting fixed and portable stations, there were well over 40 stations on the air during the day. Some of the post-mortems later in the evening from home QTHs were also most interesting.

The Victorian Division expresses its thanks to all portable and fixed stations who helped make the day the success it was. Very special thanks go to Dick VK3RZ who placed his station at the disposal of the Division and operated throughout the day as control station.

A number of S.w.I.'s submitted reports and have received a VK3AWI QSL card as an acknowledgment. Any other S.w.I. who would like a card should submit their log for the last field day or a log for the next one on 9th November.

STATIONS IN THE FIELD

Cedric VK3ACH—Point Henry.
Keith VK3YQ—Cannons Creek (near Warneet).

Don VK3ADP—Brighton Beach.

Al VK3AP—Elwood Beach.

Russell VK3BAG—Mt. Martha.

Graeme VK3BAT—Dromana.

Lin VK3ARL—Edithvale.

Bob VK3XZ—Langwarrin.

Reg VK3GX—Coves.

Theo VK3AMA—Tooradin.

John VK3AUJ—Mobile.

Chris VK3JU—Stony Point.

Ian VK3ALZ—Pretty Sally Hill.

Jack VK3AIJ—Werribee.

Ian VK3AXH—Warneet.

broadside array. It is not quite so easy to see that, at the transmitter more power will be directed toward a distant receiver by a large antenna than by a small antenna. Reciprocity shows that the latter must be true."

Although very little text book material is included here, I actually do read such books for my pleasure, but not for instructional purposes. These books are available in surprising numbers and at many academic levels, from our Public Libraries. I recommend two books which are at a standard slightly higher than that of our imported periodicals: Jask "Antenna Engineering" and Thurel "Antennas" (a translation from the French). The former is a big book of many chapters by many writers about many types of antennas. The latter has a slightly different approach to things.

Many Amateurs have failed with rhombics because they must be erected according to the book. I am not the only one either that unexpectedly had short axis radiation. I hope shortly to complete (amongst other things) the description of the 5-element yagi which is in use here on the transmitter. It is light, cheap, easy to construct and erect. In addition, it is surprisingly effective. I extend my thanks to a great number of Amateurs for their assistance and also for their technical advice.

PROVISIONAL SUNSPOT NUMBERS

JUNE 1969

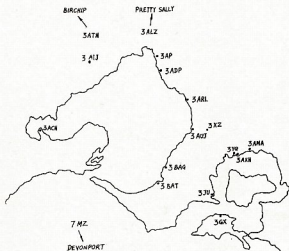
Dependent on observations at Zurich Observatory and its stations in Locarno and Arosa.

Day	R	Day	R
1	32	16	134
2	47	17	101
3	74	18	92
4	77	19	74
5	116	20	97
6	157	21	84
7	182	22	37
8	186	23	35
9	179	24	33
10	181	25	51
11	180	26	26
12	174	27	35
13	167	28	49
14	161	29	63
15	148	30	71

Mean equals 102.1.

Smoothed Mean for December, 1968, 109.4.

—Swiss Federal Observatory, Zurich.



VICTORIAN DIVISION, W.I.A. WESTERN ZONE CONVENTION

HALLS GAP

25th and 26th OCTOBER, 1969

Sat.: Registration, Trade Display,
Official Dinner, Entertainment.

Sun.: Wild Flowers, Bus Tour, and
Scrambles.

For accommodation, \$2 deposit to:
"Convention," Box 25, Ararat, 3377.

Overseas Magazine Review

Compiled by Syd Clark, VK3ASC

"73"

July 1969—

This is probably the worst produced example of "73" that I have so far come across. W2NSD/1 frequently upbraids others for their shortcomings and it is good to see that he also has his troubles. Some of the half-tone reproductions are terrible and some of the print is none too clear. The technical articles in this issue are as follows:

Confessions of an Appliance Operator, by K1YSD. A humorous article by an author who is of the opinion that Amateur Radio can tolerate all kinds of abuse.
The Ancient Modulator, W6BBIH. P.p. 1625s or 80fs for about 40 watts of audio to be used on any band.

Scan Television Signal Generator, K7YZZ. Things are really happening on s.t.v. You can join the fun.

Six Metre Linear Amplifier, WA0AB1. One kilowatt for 14c a watt; why not be heard?
A New Way to QSL, ZETJV. Simpler, less expensive, faster.

Kilowatt Amplifier for 400 Mc., W2CLL. Sneaky water-cooled coil that perks away as you smoke. (Tea or coffee any one?)

A Thirty Two, WA3AQ5. Converting and transmitting converter for 432 Mc.

Cw Can Get Your Goat, K7TFA. More humor.

Rio D'Oro, W4QCV. DX-pedition to EA9 complete with incredible frustrations.
Treasure Hunter, W2OLU. Clever ways to find out what is wrong from the ground.

Six Metre IC Converter, K1ZEL. Two ICs some new circuits and a crystal.

Radio Control Revisited, W1OLP. Model airplanes and their modern sophisticated control.

Long Range Propagation Forecasting, Nelson. Our expert explains his magic system.

Simple and Effective K.I.Y., K7RML. Unit, W6JMM. Two ICs, some tuned circuits and not a lot more.

Fads and Fads, W1JSM. More history uncovered with negligible relevance.

An IC Audio Notch Filter, W2EEY. One IC, some resistors and pots, and presto!

Converting the VRC-19 for V.h.f., F.M. W6JTT. Another attempt to boost the f.m. population explosion.

The Greatest DX of All, K5JKK. Solar flare detector.

Intelligent Tube Substitution, K1LNZ. Lovely article for tube fans.

Passive Reflectors for Amateurs, W2EEY. Most of us have wondered about this. Here is the information. A repeater with low power requirements.

Whip Antenna Add-Ons, W2EEY. V.h.f. mobilelars can get more gain and directivity.

Two Metre Transistor Exciter, WA5AJF. All transistor.

A Stable H.F. v.i.o., W5BBIH. Transistorised PC v.i.o. for any range.

"QST"

July 1969—

TouchCard II—An integrated circuit code "typewriter" by W4UX. Ingenuity has had free play in the design of this keyboard code generator. The outcome is a simple circuit that can be readily duplicated using standard components—and at relatively low cost. The novel approach to generating a very fading eye-catch could cope with such a project and so I'll have to interview the man with the box at the end of the line.

So and to Metre Listening with a Transistor BC Set, K1CIP. This article should be entitled "Have your cake and eat it too" for the b.c. set can be taken out of the case into the field and used for its normal purpose. The converter b.f.o. to make the small b.c. unit useable on the Amateur bands uses three FETs, HE9022 or MPF102. Perhaps even my fading eye-catch could cope with such a project and so I'll have to interview the man with the box at the end of the line.

The Alpha Special. W3NFT describes an all band perimeter type antenna for mobile operation. If you duplicate it you could find the jumps of PTFE set back a dollar or two. Perhaps the answer could be in replacing the

aluminum supports with rigid PVC water pipe or conduit.

An Improved 5884 Amplifier for 432 Mc., W2AHU. Running about 100 watts input to a 5884, this amplifier should be handy to increase power on u.h.f.

An Inexpensive, Precise Crystal Oven, W5QY. A few years ago the commercial units looked like this. They were precise, inexpensive, never.

The Ductopack, W4FQV. This relatively simple device attaches to the outside of a telephone handset and gives you inductive pick-up for Amateur use.

Regulated Dual Power Supply, W3TNO/8. Using operational amplifiers, this unit gives tight voltage control of plus and minus 15 volts at 50 ma.

To the Moon and Back on 2300 Mc., W1HDD. Modems. W3XCV describes a manually operated electro-mechanical digital readout antenna switch. Every keen Amateur should have one!

Australis-Oscar, VK3ZFZ and S. Howard. Design construction and operation. It is good to see the occasional foreign article appearing in "QST".

"RADIO COMMUNICATIONS"

June 1969—

A Simple Speech Compressor, G3UXH. described in a 2N1001A 2N1001A, 40V7, four diodes, a small audio transformer, and few small components. Sold to be a simple and satisfactory unit.

Two Metre MOSFET Converter, G3HFW. Designed to fill the needs of the Chesham and District Radio Society for a simple, cheap and accurate test set. The author has a noise figure of below 2 db. and a gain of about 30 db. It looks interesting.

Japanese Communications Receiver, G3GK. Reviews this receiver which is of Japanese manufacture. The reviewer considers that it is good value for the £28 asked for it in England, although it does not give the sophisticated performance which could be expected of a much higher class device. If you are interested in buying one of these read this review and learn what you are getting for the money.

An Improved Design Method for PI and L Pi Networks, G3HFW. More than a year ago Dr. M. M. Bibby, G3NJV, submitted an article to the R.S.G.B. pointing out inaccuracies in the formulae used to obtain circuit data for pi-networks and suggesting alternatives. Definitely for the mathematically inclined.

Technical Topics. Regular feature by G3VA. Here we have paragraphs on propagation, self oscillating FET mixer, solid state screen clamp, double balanced mixer, and other systems.

Frequency Independent Directional Wattmeters and an **SWE Meter**. G3PDM does his best to point up the advantage of having an instrument, whose sensitivity does not vary with frequency and describes a very compact logarithmic indicating instrument "accurate to better than 10 per cent. over the range 100 Kc. to over 70 Mc." It looks as though it would even operate on 144 Mc.

"SHORT WAVE MAGAZINE"

June 1969—

Design for an Amateur Band Receiver, by G3TDT. Part 1 of an all silicon solid state double conversion design covering 160 to 19 metres, known as the "Bhim-Tal". The author does not make much claim for where the design emanated but nevertheless it is an interesting design with a crystal controlled front end feeding into a tunable p.c. converter, 60 Kc. 5.0-5.5 Mc. Uses MOSFETs and ICs are used.

Easy Two Metre Converter, G3GQR describes a simplified design using a 12AT7 as triode r.f. amp and mixer with a crystal controlled 60 Kc. oscillator. The output can be arranged to be on practically any suitable frequency. A set to interest the beginner and v.l.o.

Linear Amplifier for Two Metres, G3DAH. Part 2 of this article continued from May issue.

"BREAK-IN"

July 1969—

A Linear Amplifier for 3.5-30 Mc. using T21 Valves. M.O. Valve Co. Report No. 15. Using two of these valves, which are very popular in the U.S.A., the amplifier can be set at 30 Mc. of 220w. below 7.5 Mc. and 130w. at 30 Mc. when operated with 1200 volts on their anodes. A simple and compact unit with a pi output network.

Television Sweep Tubes as Class AB Linear Amplifiers, L21AFL. The tube manufacturers would probably disown this idea, but they replace one under warranty, but for years certain Amateurs have been taking the inexpensive road to high power output using sweep tubes. While this can be at 30 Mc. and happy ones. D. A. Platt shows you "how".

Although not technical, it was felt that VKs would be interested to know that their Federal President, Michael Owen, VK3K1, Agrees to the above proposition in a "response" to the Gisborne (N.Z.) Conference held on Saturday, 21st May.

N.Z.A.R.T. CALL BOOK

A copy of the N.Z.A.R.T. Call Book turned up amongst the magazines this month and although I do not intend to produce a "review" of it, I consider that there may be a number of VKs who are interested in a copy so that they can place all the ZLs they work.

"RADIO ZS"

May 1969—

This journal is the official organ of the South Africa Radio League. It is usually content to publish articles which have appeared in other magazines or have been submitted by South African or American authors and this issue contains two technical articles by Americans—Using the Grid Dip Meter, W2AEF, and Using a T Network, W2EYJ. The first article is true to title and comment is unnecessary; the second deals with a circuit which uses the same components as the first, but the circuit is a different configuration. The author points out the advantages and disadvantages of both systems. Because the losses in inductors tend to be higher than the losses in capacitors of the air-spaced types, this circuit appears to give an improvement in performance over the pi network loaded type. The author also mentions whip type. This article should be of interest to the mobilizer.

June 1969—

Using the Grid Dip Meter, W2AEF. Part III. of an article by this well known American writer. WHF gives some very useful hints on this relatively simple instrument, which is common in Amateur shops.

Amateur Band Solid State Receiver, ZS6NG. This receiver covers all the h.f. Amateur bands and is claimed to be very selective and sensitive. It is of use to a number of people from the point of view of the ideas involved. Everyone knows how good the h.f. and 12800 Mc. the "common" receiver is and ZS6NG makes good use of one in this receiver.

"THE INDIAN RADIO AMATEUR"

This journal is the official organ of the Amateur Radio Society of India. It is not very regular because it does not seem to reach us regularly every month and, secondly, they appear to have a small number of contributors who are earning their living at the time of the universities, they reprint from "QST", "CQ", "Wireless World" or other overseas magazines. To be found in this issue are the following offerings:

Modern Trends in "Front End" Design, VU2JN. Balanced mixers using 7380s, FETs and toroidal coils for superior performance.

Double Conversion, Easy on BC484 Receiver, VU2KJ. Only easy on modern tubes save space. Perhaps a FET conversion would have been better again.

FET Oscillator, VU2JN describes as a "hold-day project," a FET crystal oscillator.

A Crystal Controlled Front End Converter, VU2KJ, 21 and 28 Mc. VU2KJ, consisting of a 12AT7, a 6X4, and a 6X5K, makes a 6X5K as crystal controlled h.f. oscillator.

The VU2JYJ Standard of Comparison Converter, VK3JYJ/VU2JYJ. Written by Howard VU2JYJ, who has a number of VKs who remember, this is an interesting article on a subject obviously dear to the writer's heart.

The balance of the magazine is taken up by regular features.

June 1969—

The 144 Mc. Class Transmitter, VU2JYJ. This call sign does not mean much to many VKs, but I feel sure that many VKs will remember VK3JYJ, Howard Rider, the writer of this article.

The balance of this magazine consists mainly of reprints from other publications. It is good to note that the quality of the Indian magazine appears to be very much improved over some of the issues which have come to us.

MULLARD OUTLOOK

Australian Edition, May-June, 1969—

Although not normally reviewed, it was worth a mention to the "Colour" section as it carries an article on the subject of Colour Television. In this issue is part five of a series which gives details of PAL, NTSC and SECAM tubes. I doubt a number of our readers will be interested.

New Equipment

DIGITAL CLOCK



The "Solari" 24-hour, direct read-out digital clock is a compact unit styled for the modern office or home, and is ideal for the Amateur shack. Large easy-to-see figures on the direct-read flaps give the time numerically, minute by minute; there are no hands to misread, and the dial is legible up to 33 feet. It has a silent, 220-240v. 50 c.p.s. synchronous motor, is self-starting, with a simple resetting trigger.

Lightweight, unbreakable plastic case, 7" wide, 3½" deep, and 3½" high; colors beige and light grey, with red and green being available shortly. Packed weight 2 lb. Price \$32 inc. S.T. The "Solari" digital clock is available also in 12-hour time for general use.

Further information from Bail Electronic Services, 60 Shannon St., Box Hill North, Vic., 3129.

CRYSTAL OVENS

A range of C. R. Snelgrove (Ontario, Canada) crystal ovens with cycling stabilities of between $\pm 0.01^\circ\text{C}$. to $\pm 0.25^\circ\text{C}$. suitable for housing current styles of crystal holder, is now available from R. H. Cunningham Pty. Ltd., 608 Collins St., Melbourne, Vic., 3000.

With cavity accommodation ranging from one to 12 crystals, the units incorporate the finest components, including snap action thermostats with inherent low thermal ageing properties, which ensure maximum reliability and life. A brochure giving full technical data is available from R. H. Cunningham.

PRECIOUS METAL PLATING

A comparatively new electroplating method recently introduced in Australia is finding wide application in electronic manufacture. Known as the "tintillate" electroplating process, it is used exclusively for bright tin plating by the Precious Metal Plating Co. Pty. Ltd., of Clifton Hill, Vic.

Proven advantages of "tintillate" bright tin plating of electronic devices such as transistors, diodes and components with pigtail or leads, includes a high degree of solderability coupled with corrosion resistance throughout the components' life.

Ordinary tin plating tarnishes rapidly in air, and during storage, which generally leads to poor solderability and consequent slowed production. The "tintillate" process prevents low conductivity due to badly soldered connections, or corroded terminal contacts.

Careful formulation of the plating solution concentrate is maintained for the finished product, and patented process materials are essential for this high quality plating work.

Gold and silver plating are other processes carried out by Precious Metal Plating Co. for the electronics industry; applications being printed circuits, terminals, micro-switches, contacts and relays.

Further information from Precious Metal Plating Co. Pty. Ltd., 58 Hoddle St., Clifton Hill, Vic., 3008.

REGULATED POWER SUPPLY



Newly released in Australia is a regulated power supply designed basically for the replacement of storage batteries used in the design and testing of mobile radio, and other laboratory equipment, production testing, manufacturing and service installations.

The heavy duty mains operated unit is of conventional design using a differential comparator to provide an error signal to control the operation of the four parallel connected power transistors via a voltage amplifier and two Darlingtons connected low-power transistors. An overload circuit, which operates if the output current exceeds 120 per cent. of the full load current, is provided to switch off the regulator, thereby protecting the regulator and the external circuit.

There are three output ranges of 5-8v. d.c. 20a. max., 10-16v. d.c. 17a. max., and 22-32v. 10a. max; features separate 4" voltmeter and ammeter, and all silicon solid state circuitry.

Full particulars are obtainable from A & R Electronic Equipment Co. Pty. Ltd., 44-46 Lexton Rd., Box Hill, Vic., 3128.



HI-FI STEREO CATALOGUE

A fully illustrated 40-page catalogue outlining a comprehensive range of hi-fi and stereo equipment is now available from Radio Parts Pty. Ltd., 562 Spencer St., Melbourne, or their city depot and East Malvern branch.

Equipment listed includes amplifiers, audio leads, car stereo tape players, gramophone cartridges, gramophone motors and pick-ups, gramophone hinged base and cover, head phones, microphones, speakers, tape players, tape recorder accessories and tuners.

Obtainable free of charge, the catalogue provides technical specifications, special features and trade prices for brand equipment including Raper, PE, Dual, Richard Allan, Kaltro, Sennheiser, Onkyo, Philips and Metrosound.



NAVY WEEK 1969

It is hoped that a representative station of the Royal Naval Amateur Radio Society will be on the air during the 1969 Navy Week, from H.M.A.S. Cerberus, at Crib Point on Westernport Bay, Victoria. On Saturday, 4th October, H.M.A.S. Cerberus will be open to the public, and the Amateur Radio Society will be part of a Naval hobbies exhibition.

There will be a full day's programme of Naval demonstrations and displays, and many static exhibits. Family facilities will include a picnic ground and barbecue area, babies' creche, children's playground and a discotheque for the teenagers. Light refreshments will be on sale. Public transport arrangements will include buses from Frankston station and a vintage steam train direct from Melbourne. These and other details will be given in VK3 Divisional broadcasts before the event.

Amateurs and shortwave listeners will be welcomed. A talk-in station will operate on 2 metres f.m. (Channel A) and also on the h.f. bands if requested.

There will be plenty to occupy the XYL and harmonics while the OM joins the rag-chew in the Ham Shack.

VK2 DIVISION, W.I.A.

FT243 CRYSTALS

The VK2 Division still has a number of FT243 Crystals available to members of any Division. (Frequency range from 3680 to 6405 Kc. at 10 cents each). This Division is again conducting its Store. Further printings of Amateur Guide material available. A list of items in stock is available, send name, address, postcode, and 2 x 5 cents stamps to:

THE STORE MANAGEMENT,
WIRELESS INSTITUTE CENTRE,
14 ATCHISON STREET,
CROWS NEST, N.S.W., 2065.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

WHAT DO YOU CALL IT?

Editor "A.R.," Dear Sir,

I have noted with interest, a tendency on the part of some parties to abbreviate the new and awkward "Hz" simply to "h", as for example 3800kc is am much in favour of this simplification, and I should like to suggest a further step.

It should be possible to modify this expression still further to improve clarity. Virtually everyone knows what a kilocycle means, while kilohertz takes some thinking, and "h" even more. "KHz" is no better, kilo Hertz.

This confusion could well be dispelled by adopting a simpler and more explicit term, e.g. "kilocycles," making the above example 3800kc. Although this may introduce some ambiguity, the existence of "3800 kilocycles" of radiation or "3800 kilocoulombs" of electricity seems sufficiently infrequent to cause little confusion. In Amateur circles I also note that "C" appears to have been adopted as abbreviation for "Curie".

In this matter I propose to set an example to the rest of the world, by using "kc" to represent kilocycles, "Mc" for megacycles, etc., in my articles. It is therefore, that I hope the Hertz creep into any of my articles in "A.R." (or elsewhere), it is not my doing!

—R. L. Gunther, VK7RG.

OPERATION IN ZL RARE COUNTRIES

Editor "A.R.," Dear Sir,

It would be appreciated if by means of your monthly publication you could bring to the notice of VK stations that the Upper Hutt Branch of the ZL Rare Country Club is operating portable in two unoccupied ZL Counties. The Waimarino county on the evening of Saturday, 25th October, and the Wairarapa county on the evening of Sunday, 26th October. Operations will commence on 80 metres on a frequency between 3.6-3.7 Mc. on a.m. and s.s.b. Time and circumstances will be as usual. All contacts will be QSLed 100 per cent. Contacts with ZLZVH will be useful for both A.R. and the ZL Rare Country Club.

Hoping to hear VKs in October, 73.

—J. Meachen, ZLZBHF, Branch 63.

IMPROVING THE AMATEUR SERVICE

Editor "A.R.," Dear Sir,

Rex Black's letter in the August issue of "A.R." has served to crystallise many of my own ideas regarding Amateur licensing.

In the first place I do not agree with his statement that Amateur Radio has not been proven to be an essential service. The Tasmanian, Victorian and New South Wales bush fires during the past few years and the P.M.G. use of W.I.C.E.N. are sufficient answer here. However, I do agree that band occupancy is essential if the more likely increase this deserves deep consideration.

In the same way as the A.O.L.C.P. has popularised the v.h.f. bands, some form of Novice licensing and the overall influx into the Amateur Service. Also, it is becoming clear that as the state of the art advances the present one level theory test and two level licensing system needs some overhaul with additional graded levels being introduced. The initial jump to a full licence is, in my opinion, either too great the theory sections are properly examined or the exam. level is too low if the present system endures. Both these extreme views point to the need for a new system with the U.S.A. Novice system being a good starting point.

A word about v.w. Anyone interested in portable Amateur Radio work, as we will soon find that there are serious limitations to a voice only licence. It has been said that s.s.b. eliminates the requirement for a c.w. But consider moonbounce. A superficial calculation would indicate that on 144 Mc., with 400w, p.e.p. output and an antenna of 21-22 db. gain (four 12-element 12-element beam) it would be possible to complete a circuit. But p.e.p. is not average power, so voice contact is impossible. The same applies to tropospheric scatter, auroral scatter and weak signal DX. Any consideration of noise factors leads to a rx bandwidth suitable only for c.w. under these conditions. So there is still a place indeed a requirement—for c.w. in the Amateur Service.

Further, in such serious work an h.f. link is necessary. The fact that no A.O.L.C.P.

licence has matched A.O.C.P. performance in work at the frontiers of radio communication would seem to back this view.

There seems to me to be a dual requirement:

(a) For a graded system of entry to full A.O.C.P. in which it is possible to get onto the air soon after passing with the minimum of trouble, i.e. Novice licensing as in U.S.A.

(b) For a means of encouraging the A.O.L.C.P. licensee to gain A.O.C.P. The basic entry test should cover theory to the level required by the equipment to be used and code at 5 w.p.m.

Type (a) Novices—new entrants to the Service should:

(i) Pass a suitable entrance exam. and code to 5 w.p.m.

(ii) Operate on 160, 80 and 10/11 metres in suitable band segments.

(iii) Be limited to 10-15w. input and crystal control using fundamental crystals (based on consideration of readily available components and harmonic radiation).

(iv) Be supervised during the currency of the licence by one or two full licensees or one A.O.C.P. plus one A.O.L.C.P.

(v) Have a licence period of one year—non renewable.

The supervision requirement is to reinforce the Amateur's responsibility to supervise and improve the standards of his own service and to remove the need to use commercial gear by Novice stations. This implies that gear and modifications would have automatic clearance by someone qualified to judge the requirements and state of the art of the Service.

Type (b) Novices—A.O.C.P. licensees able to gain a Novice type endorsement by passing a 5 w.p.m. Morse test enabling them to practice on 145-148.0 MHz. One year on air on a non renewable basis. Suitable call signs could be, e.g. VK3ZJ —/N.

I am not in favour of the use of a.m. by Novice stations. I would expect on 10 and 11 metres and then only in the second year if a two-year Novice licence is used. A.O.L.C.P. Novice endorsed licensees could perhaps use this privilege after their first year.

This is because I regard the prime object of Novice licensing to be to encourage full A.O.C.P. licensing and the use of ALL Amateur bands. The proposed two level system retained during the difficult period of learning theory and code by providing a means of practice by actual operation on the air.

Details of implementation I leave to the experts. My hope is that the principles I raise will aid in the improvement of the Amateur Service.

—John Andersen, VK3ZFQ (ex VK3ZFO).

USE OF 5 Mc. EXCITER BOARD

Editor "A.R.," Dear Sir,

I have been contemplating building a relatively simple 50-30 metre or 30-40-30 metre s.s.b. transceiver, suitable for duplication by other Amateurs, via an article in "Amateur Radio". The proposed project would run between 50-100 watts p.e.p. input.

To simplify building of this transceiver, I had intended using the Yaesu Musem F Series 5 Mc. Exciter Board. With no extensive modification these units could be designed so it could be made to function on both transmit and receive.

Unfortunately on contacting Fred Ball, he informs me that these units are no longer being produced. He did, though, tell me that about 80 of these units are in V.I. If enough people with these units be designed, it could be made to function on both transmit and receive.

I am immediately on contacting Fred Ball, he informs me that these units are no longer being produced. He did, though, tell me that about 80 of these units are in V.I. If enough people with these units be designed, it could be made to function on both transmit and receive.

Should owners of these filter assemblies want this project, and enough indicate so by writing to me personally, I will go ahead with it. It is anticipated that the unit would be mostly valued using quite a few parts ex-t.v. to cut costs. The unit would be designed to use the thoughts of mobile, portable and home station operation.

—Rodney Champness, VK3JUG.

34 C/Dowds Rd., Warragul, Vic., 3820.

SPACE CENTRE STATION

Editor "A.R.," Dear Sir,

After writing to Cape Kennedy, I received an interesting letter from W4WEE, the Space Centre Amateur Radio Society at the Kennedy Space Centre:

"The Space Centre Amateur Radio Society of Kennedy Space Centre, Florida, had their club station W4KCI in operation on 16th July for the Apollo 11 'Special Event'.

"The club members began operation shortly after witnessing the historic launching of astronauts Armstrong, Aldrin and Collins on their way to the moon.

"The club is offering a 'Special Event' certificate to commemorate man's first moon landing mission to all Amateur Radio operators who make contact with the club's six stations during this period.

"During the first 17-hour operation period, the club contacted 1,650 stations. Among these were contacts with 225 foreign stations, representing 50 countries. Also contacted was WIAW, the American Radio Relay League's headquarters station, and KFTBSS, the 1969 Boy Scouts of America Junior Scout Station.

"Unfortunately, the club operators were unable to contact all the many thousands trying to contact the station. Transmitters were operating on 21.340, 14.340, 12.75 and 5.975 Mc. Additionally to the s.s.b. stations above, transmitters were on 21.150, 14.935 and 7.165 Mc. c.w.

"Operators during the mission included 'Ace' W4WEU, Ambrose W4GIV, Roy K4DJN, Gus W4TQM, Herb W4BHZ, John W4JLX/X, Allen W4ZNB/4, Howard W4AZC/B, Bill W4ABWQ, Mac W4BICAC, Dave K4VTV, 'Buz' W4NTLX/4, and 'WBA' W4BWA.

"Buz' W4NTLX, age 10 years, who was visiting 'Ace' W4WEU, was surprised and pleased when he heard the club contact his grandfather, 'Ham' (Tom W4TQUD and Fran W4TQUD).

"The 'Special Event' certificates (in colour) were prepared by 'Ace' W4WEU and Roy K4DJN, and issued in the mail soon. There is no charge for the certificates other than a request for three or four 8c stamps to help the club's monthly costs.

"In June the club elected officers for the coming year. Elected were 'Ace' Goodwin, W4WEU, President; Ambrose Barry, W4GIV, Vice-President; and 'Ham' (Tom W4TQUD and Fran W4TQUD), Secretary.

"The club is now confirming 'regular' contacts with a newly designed QSL card which resembles the Apollo certificates."—Ambrose Barry, W4GIV, Publicity Chairman.

I think that this special certificate could be of interest to your readers, also stamp collectors who may be lucky and receive an envelope with a QSL card.

A colour emblem of the eagle on the moon to the side of the envelope, Armstrong's first word above and the names and positions of the astronauts would be included. WBA's station showing a view of the earth looking from the moon—very nice!

—Samson Voron, WIA-12330.

P.S.—Send reports to: Space Centre Amateur Radio Society, P.O. Box 21073, Kennedy Space Centre, Florida, 32815, U.S.A.

OBITUARY

J. M. (CRIEFF) RETALLICK, VK3XO

It is with deep regret that we must record the passing of Crieff VK3XO, who passed away suddenly on Saturday, 2nd August, at 2 p.m. in Sydney Hospital after undergoing an operation on the previous Tuesday.

Crieff celebrated his 72nd birthday last Sunday. He will best be remembered by his friends in organising the Urunga Conventions.

Anzac week-end 1948 he arranged a get-together of Amateurs at his boat-shed, the 'Go-Mo' at Urunga, when about 15 Amateurs attended. One of the week-end was the W.I.A. Urunga Radio Convention held every Easter week-end. This year saw the 21st Convention celebrated, though these Conventions Crieff became well known throughout the world. ZLs, Ws, JAs, and others hang on at one time or another attending these conventions. He was always active on the h.f. bands taking Amateurs and their families to attend Urunga, where they would be in the future. Future Conventions will be in memory of Crieff. He was always active passing traffic in most of the floods on the North Coast.

Apart from Amateur Radio, he was one of the best sleight of hand magicians in the younger days of the Sydney Magic Club. He enjoyed and excelled in his hobbies well his home-brew or photography. His possession of a gap that he had in his fill, he enjoyed and excelled in his hobbies well.

We extend our sincere sympathy to Crieff's widow, Jean, his son Richard, daughter Marie and family.

—VALE CRIEFF.

VHF

Sub-Editor: CYRIL MAUDE, VK3ZCK
2 Clarendon St., Avondale Heights, Vic., 3034

VICTORIA

Activity over the past month has been at a very low level, although this is typical for this time of the year. An occasional spot of DX has been heard, but nothing to warrant writing about.

Activity on 1296 Mc. is on the increase and there is a demand for suitable u.h.f. dish reflectors between four and twelve feet in diameter. At the moment there are about ten active stations on 1296 and others are building gear at the present time. The gear in use varies from rather large vacuum tube types to miniature solid state devices.

The V.h.f. Convention being held over the week-end 11th/12th October, 1969, will again be a gathering for Amateurs and their families. Among the events this year will be a tour by bus to Waiballa, fox hunts, scrambles both for OMs and YLs/XYLs, and a very novel transmitter hunt, together with the usual games and novelties for kids from 6 months to 60 years and older. Films, sale of disposals goods and of unwanted gear, and supper will be the programme for the Saturday. Listen to the

VK3WI broadcast on Sunday, 5th October for the final details.

Field Days.—The list of V.h.f. Field Days given last month should be amended to: No Field Day in February and an additional Field Day in March on Sunday, 15th. There is a small variation to the scoring for some bands and full details will be given in the VK3WI Sunday broadcasts on the Sunday prior to and on the Sunday of the Field Day.

V.h.f. Beacons.—Approval has been granted by the P.M.G. Department for the proposed two metre beacon on 144.700 Mc., and the application for the 432 Mc. beacon is still under consideration. Quite a lot of work has been completed on these beacons but there is still much to be finished. 73, Peter VK3ZY0.

TASMANIA

A late (very) note from Brian VKTRR reports that a repeater for Southern Tasmania is now being tested and should shortly be operational. Activity in the Apple Isle is on the increase on both 8 and 2 metres.

Recently a Trade Fair was held in Hobart, and VK3WI was operated on both h.f. and v.h.f. V.h.f. equipment on display was supplied by VK7ZMK and VK7MD. The effort brought the display a certificate of merit.

AUCKLAND, NEW ZEALAND

The Auckland V.h.f. Group wish to notify VK Amateurs that they will be holding these events: Sunday, 19th Oct., 1030 hours E.A.S.T., two meter tx hunt; Saturday and Sunday, 6th and 7th Dec., V.h.f. Field Day; Saturday and Sunday, 7th and 8th Feb., V.h.f. DX Contest; Saturday, 27th Sept., Matamata ZL1RF Memorial Mobile Rally; and on Saturday and Sunday, 8th and 9th Nov., the Hamilton Week-end. A small group of Amateurs in ZL1 are attempting records on the upper u.h.f. bands, notably 3000 Mc., 5800 Mc., 10,000 Mc. and one has a klystron on 19,999 Mc., and would like to obtain another.

The above news was supplied by Marion Lister, ZL1TBR, Editor of "Spectrum," the official newsletter of the Auckland V.h.f. Group.

NEW V.H.F. SUB-EDITOR

As from the December issue, the VHF Notes will be compiled by Mr. Eric Jamieson, VKSLP, of Forreston, South Australia.

With the change of Sub-Editor, there will at the same time be a change of format to give a wider coverage to items of general interest to all v.h.f. enthusiasts. To ensure an adequate supply of information, both Divisional and Zone Correspondents are asked to keep Eric advised of interesting items from their areas. At the same time individual operators are invited to forward items direct to Eric. Items particularly required are those covering activities on Moonbounces, v.h.f. beacons, records and other special efforts.

To be sure that Eric is given sufficient time to produce his page each month, all material should be forwarded in time to reach him no later than the 27th of each month. To repeat, Eric's address is:

MR. E. JAMIESON,
FORRESTON,
SOUTH AUSTRALIA, 5233.

VICTORIAN DIVISION, W.I.A.

V.H.F. CONVENTION

will be held on

**SATURDAY AND SUNDAY,
11th and 12th OCTOBER, 1969**

at

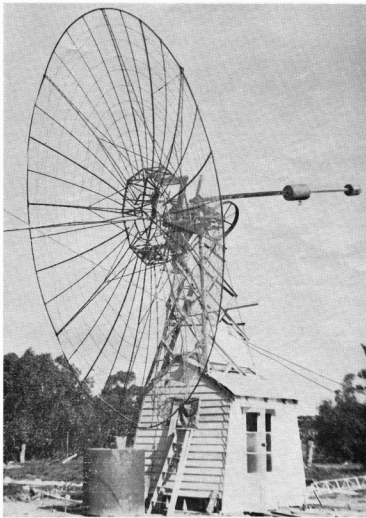
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Gil Sones 288-2794 (Melb.)



The above photograph shows the "dish" used by VK3ATN. Some brief details are that the dish is 28 feet in diameter, the centre octagonal hub being 7 feet in diameter. The actual antenna (which is out of the picture) is 16.2 feet from the vertex. The tower, which is 20 feet high, is 2 feet square at the top and 8 feet square at the base. The foundation is 9½ feet deep and contains approximately 10 tons of concrete. Modifications and further construction work are still in progress, to enable the dish to be used for 1296 Mc. Moonbounce and Apollo tracking. No details have been supplied for the small structure alongside the tower, and no prizes are being offered for the best suggestions.

Sub-Editor: DON GRANTLEY
P.O. Box 222, Penrith, N.S.W., 2750
(All times in GMT)

It would seem that band conditions are holding up rather well, with some very good openings in the 40, 80 and 160 MHz bands. The sunset prediction for August, September and October is 95, 93 and 92 with confirmations for March and April being 139 and 105.

Operating from the Space Control Centre during the period in which the Apollo 11 boys were in quarantine, K5USO made many contacts and for these a special QSL is available from ZB 29265, New Orleans, 70129, three IRCs to be sent with each QSL.

Operation from Tristan da Cunha by Roy G8DYD is under way using the call ZD7BM. Look for him on 3758 Saturdays and Mondays, 2130z to 2230z, also uses 2131z, 301 and 270 on a.s.b., with c.w. operation on 2104z. All QSLs to G8DYD, QRV for two years.

ZLIAAT/K, Kermadec Island, is to be activated by ZLIANX (ex G3KXA), who goes there in mid October as OIC and Medical Officer for the Met. Sigs. and for at least one year. He will be active on all bands except 160 and using both c.w. and a.s.b. There is only one mail delivery per year to this location, so if you want to contact Roy before he goes, a letter to him, R. Swain, 80 Le Mata Rd., Haydock Nth., N.Z., will do the trick. General QRV for two years.

9V0 was a special prefix used by 9V1 stations from 9th Aug. to 9th Sept. in connection with the 150th anniversary of the founding of Singapore. The Met. Sigs. have made a special award has been issued for working ten 9V0 stations during that period, send log extract plus 10 IRCs to Box 777, Singapore.

At the sitting this, Joe W4BPD was due back at his home QTH. He had been operating from SZAEHR and had hoped to operate from TT8 prior to his departure.

Don HH8D has just returned home after a absence of several months and is again active. He states that recent c.w. activity using his call was illegal.

Navaas is appeared on the scene in a special mobile call ZN10Z from Aug. 9 to 12. All QSLs to home QTH.

Corsica though fairly active of late is still good DX, the latest jump is by F0R5/PC, operated by several DXs and will be really big one. Frequencies are to be 2630, 7035, 14065, 21065 and 28065 for c.w., and 2797, 7075, 14115, 14065, 21365 and 28065 a.s.b. An inverted vee band is used 40, 80 and 160 with a quad on 15 and 10. All QSLs to DL3LL.

Been calling FBZ6Z with no result? Suggest that a listen to your own frequency may find that FBEXX is calling you there.

During the "CQ" W.V. Phone Test, Oct. 25 to 26, there will be a new call ZF0DX by the chairman, W3MSEK and W4BVV. There are nine operators listed in the LIDXA bulletin, and the details are 180 metres 3300z-0600z (call 14065, 21365 and 28065 a.s.b.). An inverted vee band is open, 40, 20 and 15 will be on for 24 hours per day, around the edge of the General Licence boundary, with 10x operation on 2857z.

Upper Volta XT2AA is reported currently active on 15 and 20 metres, and will be at the QTH for the rest of the year. His QTH is dougou, Upper Volta, although one report says that his manager is W4SEUR.

Operation from Albania is reported by the LIDXA boys, who say that TA2SC is on 1428Z QSL via K4EP1, and TAIKT has been working on 1414 (QSL to K4EIX).

One of the boys has been active allegedly from Albania by a station signing ZASXQ on 1420Z. No QSL information given, although much recent activity has been reported, this operation must be treated as suspect.

Bob Fowler, W8WVU, from New Jersey, has not got a licence and is really getting out. He is daily at about 2300z on 14240 or 21320 depending on conditions.

Western Carolines are always good for a bit of DX area. The station is VK3AAX on KC8CT on 14265 when QSL manager W4VW skeds him at 1200z Monday, Wednesday and Friday. Not on that frequency, he may be on 1428Z.

News from Thailand via A.R.R.L. bulletin 232 to the effect that the I.T.U. has reported that the Thai side's objection to the Thai side QSOs with its Amateurs. It is understood

that this country has been removed from the U.S.A. "banned" list.

St. Helena still continues to provide some rare DX, with the regular operation by ZD7SD, usually at the most inconvenient hour for VK of around 200z. His QTH for QSLs is W. R. Stevens, St. Helena, South Atlantic Ocean.

New prefixes 4J and 4L are being used by 4J0FR and 4L0CR for their University of Moscow Amur River Expedition over the period Aug. 10 to Sept. 15. QSLs to Box 85, Moscow.

W4CWC reports having worked his 100th country on 80 mx in March, having passed this figure on other bands. He is not first in the 8-band DXCC race but it is a really fine effort with scores of 119, 125, 155, 144 and 140 on 80 through to ten in that order. I know of three S.W.'s in Europe who have performed a similar feat.

A letter to hand from Karol OK3UH/VK3 offering to supply the QTH of any OKI-OKS and OLI-OLD Amateur. A letter to Karol Nad, OK3UH, Flie: Cowper St., C.H. Ltd., Fairmeadow, N.S.W., 2519, will suffice. I suggest a s.a.e. as well.

B1N1MX, operated by Rev. Fr. Moran, still provides some DX, with his couplings. He stands by for Pacific contacts from 1430z on 14230, and QSLs go to W3KVCQ/2, 2398 Branch, Cincinnati, Ohio, U.S.A.

Further to the previous report on the Thai/Thailand operational situation, the A.R.R.L. have now announced that they will accept HS QSLs for DXCC credit if the operator is a Thai national. The Thai QSLCB Chanki, is reported on 21301 at 130z.

I have had some queries here re the reported operations of CR4G by VK8BFI and others. Only one contact on 5.5, 250 to 7 Mc., 200 on 14 Mc., 300 on 21 Mc., 250 on 28 Mc. For North American endorsement 126 prefixes, South America requires 80, Europe 146, Africa 80, Asia 68, and Oceania one dollar. One U.S. with one IRC for each endorsement. QSLs must be in your possession at the time of claiming and must show clearly band, mode and date.

There has been a postponement of the TICI jaunt to Cocos is, by Don K6GS/HK3 and Carlos HK3VA/TICOF. Seven operators will be going along on the jaunt. The call for stations will be QRV 10 to 80 mx for five or six days in late Jan. or early Feb. 1970.

Call sign allocations in the German Democratic Republic are as follows: a call sign by three letters is issued where the operator is sole operator and owner of the station; DM3 followed by three letters indicates second, third, etc., operators of the station, followed by two letters is first operator of a club station; DM6s are special mobile calls; DM9 calls are issued to clubs; DM10 calls are issued to clubs; DM11 calls are issued for special and exhibition stations.

Pirates I guess will always be with us, and PKG5G and 121 are still active. I don't understand that I.T.U. have and will not issue any calls beginning with the figures one and zero.

To clarify the prefix situation in the Maldives, the British base on Gan will continue to use VS9 and VS9MB will continue as is, however all other stations will use the prefix QZ. In the new ruling, the BQAWA (no significance) and BQAYL have been about for over six months.

New special prefixes issued by Italy were: I special services, 12 Milan, 13 Venice, 14 Bologna, 15 Firenze, 16 Bari, 17 Naples, 18 Reggio Calabria, 19 Piedmont, 10 Rome.

Operating times for the week days 1700z to 1800z on 14150-150, with occasional use of 21350 or 28550z week days at 1600z. On Thursdays they come on at 2030z 3790 a.s.b. and Sunday's operation is on 7035 a.s.b. 0830z. All times one hour later in the winter; my card direct ex Bro. Edwin Amran, S.J., Box 404, Rome. It is requested that cards not be mailed to the Vatican.

PERSONAL NEWS

From Jack VK3AAX comes a long list of stations heard and worked. Amongst them such prefixes as UR2, YO2, TJ, EA8, FMTWQ, CRAL, VQ5CC, LX2TRQ, XR, YU2, DJ, URS, and worked W0LZL on a 20 mx dipole up only 15 feet.

The proposed use of the AX prefix for the year 1970 has caused a lot of interest both here and overseas. The VK3AAX and VK3AAX are looking forward to its use. With many of the DX gang prefix-hunting these days, it will be a lot of interesting calls being made into VK next January from all reports.

The R.D. week-end provided good conditions for that event, too good in fact for the DX was pouring in on 20 and 15 during the contest period. I for one couldn't resist taking a break

from the event when CT, 974, 905, 328, 708 and ZL8, a name a few, were coming in.

I mentioned a couple of months ago that Roy Waite, one of the best known of the Newark News boys, and manager of the QSL Bureau operated for Popular Electronics, suffered a stroke. It is pleasing to hear from the States that Roy is now on the mend and has some movement in his left arm. Just as it is interesting to hear from the States, has verified 844 prefixes up to May this year.

QSL MANAGER

VED3LC, Ron Kruger, 39 Zenith Drive, Scarboro, Ontario, Canada, handles QSLs on behalf for the following: H18XJA, H18XPM, H32BD, OXSAV, VPIFW, VPIFM, VPBBD, VPZGBH, VPZCJ, VPKR, VPIVA, VPIH, VPIYAL, Z2AKL, 6X3, 6Y3CB, 6Y6B, 6Y8RM, 7X0AH, 8PAH and AZ, 8PB6M, 8PB6N, 8PB6X, 8PB6D, 8PB6C, 8R1S, 8RIU, 8RIK, 8RI2 and 9Q6EF.

AWARDS

I mentioned previously the prefix hunters, and I am sure that interested persons know all about available awards, recently however, "CQ" magazine made their WPX award available to S.W.'s on a heard basis, the new award being the WPX award (verified). Award allocation must be made on official forms and these, plus copies of the rules, can be had for one IRC from the WPX Manager, 64101 W. 14th, Kalamazoo, MI 49001, U.S.A. Requirements whether worked or heard, are briefly, 400 verified FX mixed modes, 300 verified FX mixed modes on 300 or a.s.b., with endorsements for each additional 50 prefixes. Other endorsements are 35 verified on 8, 150 verified on 5.5, 250 to 7 Mc., 200 on 14 Mc., 300 on 21 Mc., 250 on 28 Mc. For North American endorsement 126 prefixes, South America requires 80, Europe 146, Africa 80, Asia 68, and Oceania one dollar. One U.S. with one IRC for each endorsement. QSLs must be in your possession at the time of claiming and must show clearly band, mode and date.

SOME QTHs

CP1GN-C/o U.S. Embassy, La Paz, Bolivia.

FG7XX-Via W3CTN, 159 Ketchikan Ave., Amityville, N.Y., 11701.

HC1TH-Box 2444, Quito, Ecuador.

CO4USM-Via WA4NCE.

OAUXM-Box 538, Lima, Peru.

VPIJIT-Via VELASJ.

JY3JM-Via Radio Santo, New Hebrides.

YK1AA-Box 3, Damascus, Syria.

VY9QW-Box 41, Acaragua, Venezuela.

4Z4AA-Via W8ZWOW.

5N2AX-Box 3360, Lagos, Nigeria.

8P6AU-Via WBPCI, 134 Ave. "C", Wayne, N.J., 07470.

8QAYL-All QSLs to 102/11, Templar Rd., Mt. Lavinia.

8Y4KK-Via Koety, 1823 W. Maine St., Jefferson City, Mo. 64101.

That is about as far as we can go this month, due to the absence of our regular report from the ISWL. My thanks to VK3AAX, U.S.A. N. George, ZL2AFZ, Mac, Hillard, Maurice, and October, 1969. It is now time for the new Radio Club bulletin, Lew Sharpley, Ray Moseley from G-land, and LIDXA bulletin. I look forward to the publication of this bulletin and VK operators in the following months and hope you all have a good season or two in the VK/ZL Contest this year. 73, Don 12022.

FEDERAL AWARDS

"CQ" AWARDS

"CQ" Magazine has recently announced that the "CQ" SSB DX Award is to be discontinued. As all applications had to be received in the U.S.A. on 1st October, 1969, it is now too late for any further applications from VK. Despite declining applications from the rest of the world, the CQ Magazine has decided to award the award, the VK applications were steadily increasing each month.

As a result of the withdrawal of this award, the only one now open is the W.A. Award which the Federal Awards Manager W.A. will continue to certify applications for, the "CQ" W.A. Award. Applications for this will be accepted as previously announced. This collection of applicants for the W.P.X. Award offered by "CQ" are asked to contact the magazine direct for application forms, as no checking of cards is required in this case.

—Geoff Wilson, VK3AMK.

Federal Awards Manager.

AUSTRALIAN RESULTS 1968 "CQ" W.W. DX CONTEST

	Band	Points	Cont.	Zon.	Ctrs.
VK2EO	20	333,294	556	60	138
VK2VY	20	89,540	267	59	69
VK2APK	14	228,635	703	75	75
VK3RJ	20	13,282	126	16	22
VK3QV	20	3,213	153	9	12
VK3AP	21	171,666	578	32	67
VK3AXK	21	101,392	417	27	57
VK3ABA	21	27,434	102	22	39
VK3QI	20	30,778	144	21	22
VK3APN	3.5	5,046	103	13	16
VK3OP	3.5	2,652	45	9	10
VK3XB	3.5	1,560	43	9	10
VK3FM	A	159,848	485	54	62
VK3FM	A	103,785	416	25	60
VK3SKO	A	12,555	222	45	41
VK3RU	A	607,211	822	66	186
VR1P	A	41,448	209	53	33
VK2BR	A	6,810	78	20	21
VK2BKM/LH	A	705,296	1698	85	137

N.B. 1. VK2BKM/Lord Howe Is. won the World Contest Expedition Trophy, "Dr. Harold Megibow Memorial," donated by D. Miller, W9WNV.

2. VK2APK was sixth highest scorer on 14 Mc.

	Band	Points	Cont.	Zon.	Ctrs.
VK2AND	20	42,425	329	21	24
VK2APK	14	320,059	753	37	112
VK3QV	20	27,554	205	20	26
VK3SM	21	804	26	6	6
VK3ARX	14	42,589	179	24	60
VK3KS	14	3,520	74	8	7
VK3SLC	20	7,415	185	15	17
VK4FH	A	132,485	384	52	69
VK4CK	A	74,715	295	38	47
VK4SS	20	8,556	94	21	23
VK4SD	14	20,216	133	20	72
VK4UC	14	24,210	102	33	57
VK4DO	14	21,900	103	25	50
VK4SLC	20	29,300	120	22	72
VK6RU	A	1,491,644	1543	113	221
VK6XX	20	311,163	1139	27	76
VK6XI	A	21,356	198	36	21
VK6DR	A	5	40	5	5
VK6KS	14	38,432	155	31	61



AGENT MOVES

R. H. Cunningham Pty. Ltd. Queensland agent, L. E. Boughen & Co., formerly of 95 Central Ave., Sherwood, Qld., has moved to a new office at 30 Grimes St., Auchincloss, Qld. The Company's new postal address is P.O. Box 136, Toowoong, Qld., 4066; telephone 7-4097.

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CONTEST CALENDAR

4th/8th October: VK/ZL/Oceania DX Contest (Phone).
4th/12th October: Lebanese DX Contest.
11th/12th October: VK/ZL/Oceania DX Contest (CW).
11th/12th October: R.S.G.B. 28 Mc. Telephone Contest.
18th/19th October: W.A.D.M. DX Contest (CW only).
25th/26th October: "CQ" W.W. DX Contest (Phone).
25th/26th October: R.S.G.B. 7 Mc. Contest (CW).
8th November: International OK DX Contest (CW only).
8th/9th November: R.S.G.B. 7 Mc. Contest (Phone).
15th/16th November: R.S.G.B. 1.8 Mc. Contest.
29th/30th November: "CQ" W.W. DX Contest (CW).
Dec., 1969, to 11th Jan. 1970: Ross A. Hull V.H.I. Memorial Contest.
6th/7th December: C.H.C. International DX Contest (CW).
13th/14th December: C.H.C. International DX Contest (SSB).
1st/2nd Feb., 1970: John Moyle National Field Day.
7th/8th Feb., 1970: 36th A.R.R.L. International DX Competition (1st Phone week-end).
21st/22nd Feb., 1970: 36th A.R.R.L. International DX Competition (1st CW week-end).
7th/8th March, 1970: 36th A.R.R.L. International DX Competition (2nd Phone week-end).
21st/22nd March, 1970: 36th A.R.R.L. International DX Competition (2nd CW week-end).

1969 "CQ" W.W. DX CONTEST

PRECIS OF RULES

Starts 0000 GMT Saturday, Dec. 26/27 GMT Sunday. Phone: Oct. 25-26. CW: Nov. 29-30. All Amateur bands 10 through to 160 metres.

Type of Competition:

1. Single operator.
 - (a) Singleband.
 - (b) All band.
2. Multi-operator (all-band operation only).
 - (a) Single transmitter (only one signal permitted).
 - (b) Multi-transmitter (only one signal per band permitted).

Two types of multipliers will be used: (1) A multiplier of one (1) for each different zone contacted on each band; (2) a multiplier of one (1) for each different country multiplier contacted on each band. Stations are permitted to contact their own country and zone for multiplier credit. The "CQ" Zone Map, DXCC Country List, WAZ Country List and WAC continental boundaries are the standards.

Contacts between stations on different continents are worth three (3) points. Contacts between stations on the same continent but different countries are worth one (1) point. Contacts between stations in the same country are permitted for zone or country multiplier credit but have zero (0) point value. Only one contact with the same station on the same band is permitted.

The final score is the result of the total QSO points multiplied by the sum of your zone and country multipliers. Example: 1000 QSO points multiplied by 100 multiplier (30 zone plus 70 countries) equals 100,000 final score.

All scores will be published. To be eligible for an award a single-operator station must show a minimum of 12 hours of operation. Multi-operator stations must operate a minimum of 24 hours. A single-band log is eligible for a single-band award only. If a log contains more than one band it will be judged as an all-band entry.

Log instructions: All times must be kept in GMT. Use a separate log for each band. Indicate zone and country multipliers only the first time they are contacted on each band. Each entry must be accompanied by a summary sheet showing all scoring information, the category of competition, the contestant's name and address in block letters, and signed declaration that all contest rules and regulations for Amateur Radio in the country have been observed.

All entries must be postmarked no later than 1st December, 1969, for the Phone section, and 15th January, 1970, for the CW section. Logs go to: "CQ" W.W. Contest Committee, 14 Vanderventer Avenue, Port Washington, L.I., N.Y. U.S.A. 11659. (Indicate phone or c.w. on envelope.)

SILENT KEY

It is with deep regret that we record the passing of—

VK2XO—J. M. (Crieff)
Retallack

HAMADS

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FOR SALE: F1R0B Receiver, FL200R Transmitter, F550 pipe, will separate, L. Jones, No. 3 T.E.L.U., R.A.A.F., Pearce, W.A., 6085.

FOR SALE: Galaxy III, spotless condition, complete with matching p.a.-splr. unit (capable of running 1200w. p.a.p. in addition to Galaxy), \$320. External VFO, \$45. Matching 10 Kc. xtal calibrator \$15. Dynamic PTT Mic. \$10. Chassis master Antenna Rotator, complete with 100 ft. cable, control unit. Chassis master thrust-bearing, as new, in original carton, \$50. New galv. steel 30 ft. telescopic mast, \$22. 48 Orchard St., Glen Waverley, Vic. Phone 232-9492.

FOR SALE: Gelooso G20XR Receiver; Gelooso G222T transmitter. In perfect condition, complete with circuit diagrams and SSB mod. sheet for 200R. \$150. J. Nairn, P.O. Box 432, Traralgon, Vic., 3844.

FOR SALE: Hallicrafters SX Communications Receiver, 550 Kc. to 42 Mc., continuous in six bands. Bandspread 80 to 10, product detector, handbook, good performer, will securely carry for transport, price \$120. K. Downing, VK4FX, P.O. Box 504, Sundaberg, Qld.

FOR SALE: Two TV Picture Tubes, type Radioron TR19A, 17 inch, 90 deg. One new in sealed original carton, \$20. One used as new complete with matching yoke and e.h.t. transformer, guaranteed, \$10 the lot. Will freight anywhere. J. Thornton, 23 Esplanade, Plaist, Qld., 4555.

SELL: Mercon CR100 Receiver, complete with transceiver and Gelooso Front-End Converter, \$100 the two, or near offer. Will sell separately if requested. B. L. McCubbin, VK3SO, 3 Kildare St., Burwood, Vic. 3125. Phone: home 288-1587, work 62-1851 ext. 171.

SELL: MR3A High Band 3-Channel, outboard transistor power supply, \$20. J. H. Smith, VK3AF, 17 Duncan St., Box Hill, Vic. Phone 288-2552.

WANTED: AR88 with product detector or SX100 or similar for general coverage b/c and to 30 Mc. or plus. Price and details to J. Thompson, 20 Alexander Ave., Rose Park, S.A., 5067. Phone 31-1538.

WANTED: Electronic Keyer with monitor and, further, TRIO Communications Receiver 9H-35DE with speaker, SPDE or similar equipment. Karol OK3UH, Fife Cowper St., Fairy Meadow, N.S.W., 2519.

WANTED TO BUY: Collins 3510-D Mobile Mount, also MPI Mobile Power Supply for Collins KWM2. G. W. Dennis, VK3TF, 73 Nicholson St., Footscray, Vic. Phone 68-2751, a/h 34-5543 (Melb.).

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HEAVY DUTY—MAINS OPERATED

A Regulated Power Supply designed basically for the replacement of storage batteries used in the design and testing of mobile radio equipment, and other laboratory, production testing, manufacturing and service installations.



TYPE PS 90

The regulator is of conventional design using a differential comparator to provide an error signal to control the operation of the four parallel connected power transistors via a voltage amplifier and two Darlington connected low-power transistors. Base current for the Darlington connection is supplied from a constant current source which may be adjusted to minimise the output impedance. The output voltage may be adjusted by a front panel control within the limits stated for each range.

An overload circuit, which operates if the output current exceeds 120% of full load current, is provided to turn off the regulator, thereby protecting both the regulator and the external circuit. A current sensing circuit is used to fire an SCR which completely removes base drive from the series transistors. Normal operation is restored by removing the overload and pressing the re-set button on the front panel. Thermal cutouts are used on each power heat sink for overload protection under excessive ambient temperature conditions.

SPECIFICATIONS

Input: 240V, plus or minus 10% 50 c.p.s.
Output: Range 1, 5-6V, DC 20A max.
Range 2, 10-15V, DC 17A max.
Range 3, 22-32V, DC 10A max.
Regulation: Load and Line 0.2% on all ranges.
Ripple and Noise: Less than 20 mV, p-to-p, on all ranges.
Output Impedance: Less than 5 milliohms.
Overload Protection: Fixed electronic trip-out at 20% over current on all ranges. Push-button re-set on front panel.
Circuitry: All silicon solid state.
Metering: Separate 4 inch voltmeter and ammeter.
Size and Weight: 18 1/2" in. wide, 14 in. deep, 12 in. high. Approx. 58 lb.

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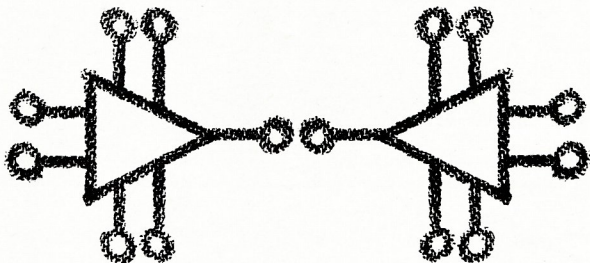
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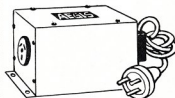
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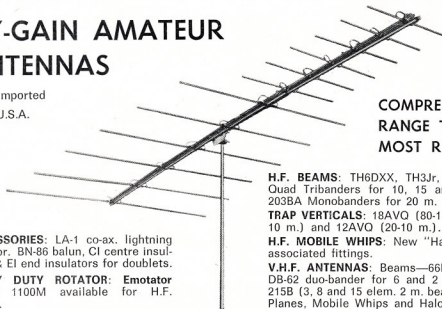
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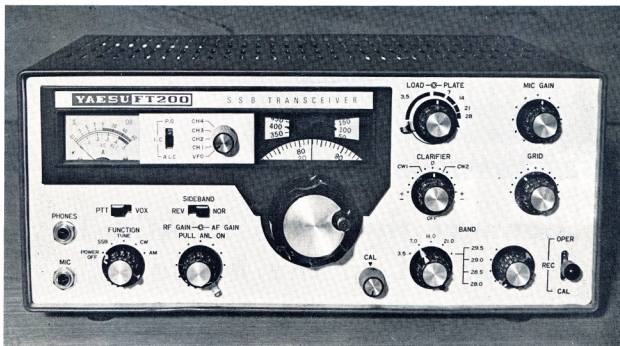
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